David Ford, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-6509
dford@clinellc.com

October 17, 2016

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification // Site Number: CT2174
525 Orange Center Road, Orange, CT 06477 (Site Name: Orange, CT)
N 41'-16'-25.3'' // W 73'-1'-7.8''

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC (ñAT&Tò) currently maintains nine (9) antennas at the 148 foot level of the existing 160 foot monopole tower at 525 Orange Center Road, Orange, CT 06477. The tower is owned by Cellco Partnership d/b/a Verizon Wireless. The property is owned by the Town of Orange. AT&T now intends to replace three (3) of its existing antennas with three (3) upgraded models for its LTE upgrade. These antennas would be installed at the 148 foot level of the tower. AT&T also intends to install six (6) remote radio units behind the antennas.

The current proposal involves an antenna swap only (three for three); no antennas will be added.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to James Zeoli, Town of Orange First Selectman, as well as the tower owner, Cellco Partnership d/b/a/ Verizon Wireless and ground owner, The Town of Orange.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

Attached to accommodate this filing are construction drawings dated September 27, 2016 by Centek Engineering, a structural analysis dated September 26, 2016 by Centek Engineering and an Emissions Analysis Report dated October 2, 2016 by EBI Consulting.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading as shown in the attached structural analysis by Centek Engineering dated September 26, 2016.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

_____

David Ford, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-6509
dford@centerlincommunications.com

Attachments

cc: James Zeoli, First Selectman ï Town of Orange - as elected official
Cellco Partnership d/b/a Verizon Wireless - as tower owner
Town of Orange - as property owner

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

AT&T Existing Facility

Site ID: CT2174

Georges Cellar Hill South
525 Orange Center Road
Orange, CT 06477

October 2, 2016

EBI Project Number: 6216004413

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	9.49 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

October 2, 2016

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2174 – Georges Cellar Hill South**

EBI Consulting was directed to analyze the proposed AT&T facility located at **525 Orange Center Road, Orange, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **525 Orange Center Road, Orange, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **Powerwave 7770 and the CCI HPA-65R-BUU-H6** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **148 feet** above ground level (AGL) for **Sector A**, **148 feet** above ground level (AGL) for **Sector B** and **148 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	**0.49 %**	Antenna B1 MPE%	**0.49 %**	Antenna C1 MPE%	**0.49 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 dBd	Gain:	11.4 dBd	Gain:	11.4 dBd
Height (AGL):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 feet**
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	828.23	ERP (W):	828.23	ERP (W):	828.23
Antenna A2 MPE%	**0.26 %**	Antenna B2 MPE%	**0.26 %**	Antenna C2 MPE%	**0.26 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A3 MPE%	**1.36 %**	Antenna B3 MPE%	**1.36 %**	Antenna C3 MPE%	**1.36 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.11 %**
Verizon Wireless	1.91 %
Clearwire	0.07 %
Sprint	0.45 %
T-Mobile	4.95 %
Site Total MPE %:	**9.49 %**

AT&T Sector A Total:	2.11 %
AT&T Sector B Total:	2.11 %
AT&T Sector C Total:	2.11 %
Site Total:	9.49 %

AT&T _ Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	148	1.48	850 MHz	567	0.26%
AT&T 1900 MHz (PCS) UMTS	2	656.33	148	2.34	1900 MHz (PCS)	1000	0.23%
AT&T 850 MHz GSM	2	414.12	148	1.48	850 MHz	567	0.26%
AT&T 700 MHz LTE	2	940.05	148	3.35	700 MHz	467	0.72%
AT&T 1900 MHz (PCS) LTE	2	1,791.23	148	6.39	1900 MHz (PCS)	1000	0.64%
						Total:	2.11%

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	2.11 %
Sector B:	2.11 %
Sector C:	2.11 %
AT&T Maximum Total (per sector):	2.11 %
Site Total:	9.49 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.49 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

WIRELESS COMMUNICATIONS FACILITY
CT2174 - LTE 2C
ORANGE
525 ORANGE CENTER ROAD
ORANGE, CT 06477

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT

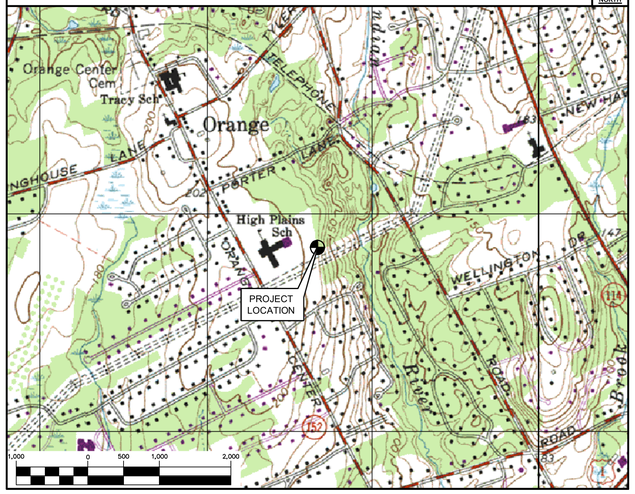
TO: ORANGE CENTER ROAD, ORANGE, CONNECTICUT

1.	START OUT GOING NE ON ENTERPRISE DRIVE TOWARD CAPITAL BLVD;	0.4 MI.
2.	TURN LEFT ONTO CAPITAL BLVD;	0.3 MI.
3.	TURN LEFT ONTO WEST STREET;	0.3 MI.
4.	MERGE ONTO I-91 S VIA RAMP ON THE LEFT TOWARD NEW HAVEN;	9.7 MI.
5.	MERGE ONTO CT-34 E/DERBY AV/DERBY TNPK VIA EXIT 57 TOWARD ORANGE;	22.0 MI.
6.	TURN SLIGHT RIGHT ONTO ORANGE CENTER ROAD / CT-152;	0.7 MI.
7.	525 ORANGE CENTER ROAD IS ON THE LEFT;	2.1 MI.

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   A. REMOVE AND REPLACE EXISTING LTE ANTENNA FOR PROPOSED LTE HEXPORT ANTENNA, (1) PER SECTOR.
   B. INSTALL (3) NEW RRUS-12+A2 ON EXISTING RRU TOWER MOUNT. RECONFIGURE AS REQUIRED.

PROJECT INFORMATION

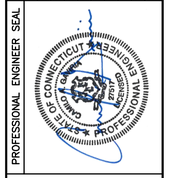
AT&T SITE NUMBER:	CT2174
AT&T SITE NAME:	ORANGE
SITE ADDRESS:	525 ORANGE CENTER ROAD ORANGE, CT 06477
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-16'-25.3" N LONGITUDE: 73°-1'-7.8" W GROUND ELEVATION: ±191' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES, SPECIFICATIONS AND DETAILS	0
C-1	PLANS AND ELEVATION	0
C-2	LTE 2C EQUIPMENT DETAILS	0
E-1	LTE SCHEMATIC DIAGRAM AND NOTES	0
E-2	LTE WIRING DIAGRAM	0
E-3	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	09/27/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL



at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

ORANGE

CT2174 - LTE 2C

525 ORANGE CENTER ROAD
ORANGE, CT 06477

DATE: 09/24/16

SCALE: AS NOTED

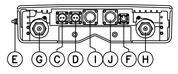
JOB NO. 16071.38

TITLE SHEET

T-1

Sheet No. 1 of 7

SIDE PANEL

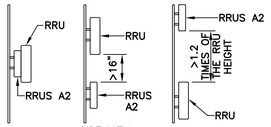


BOTTOM VIEW

CONNECTION INTERFACE

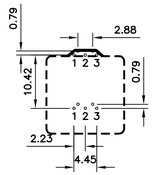
POSITION (ID)	DESCRIPTION	MARKING
A	OPTICAL INDICATORS	I, ↯, ↯, O-1, O-2
B	MAINTENANCE	🔧
C	−48V DC POWER SUPPLY	POW IN
D	−48V DC POWER SUPPLY TO RRU	POW OUT
E	GROUNDING	⏚
F	RET	RET
G	ANTENNA B	B
H	ANTENNA A	A
I	OPTICAL CABLE 1	O-1
J	OPTICAL CABLE 2	O-2

NOTES:
1. STACKING OF RRU's IS NOT PERMITTED.
2. NO PAINTING OF RRU OR THE SOLAR SHIELD IS ALLOWED.
3. A SINGLE RRUS A2 CAN BE INSTALLED AS A STAND ALONE UNIT OR MOUNTED TO THE BACK OF ITS ASSOCIATED RRU.



SIDE VIEW

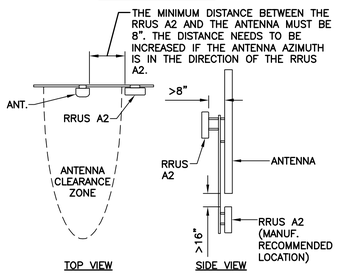
RRUS A2 MANUFACTURER INSTALLATION REQUIREMENTS



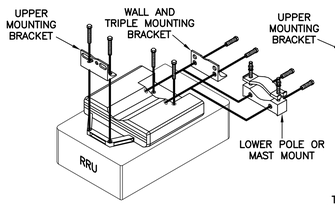
THE NUMBER OF BOLT HOLES DEPENDS ON THE WALL MATERIAL, AS SPECIFIED BY THE SITE ENGINEER. A MINIMUM OF TWO BOLT HOLES ARE RECOMMENDED FOR EACH BRACKET.

ONE OF THE FOLLOWING SOLUTIONS FOR HOLE POSITIONS MUST BE USED:
- 1, 3
- 1, 2, 3

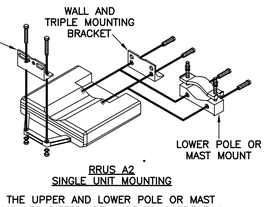
WALL MOUNTING BRACKET INSTALLATION



TOP VIEW SIDE VIEW



RRUS A2 W/ASSOCIATED RRU MOUNTING

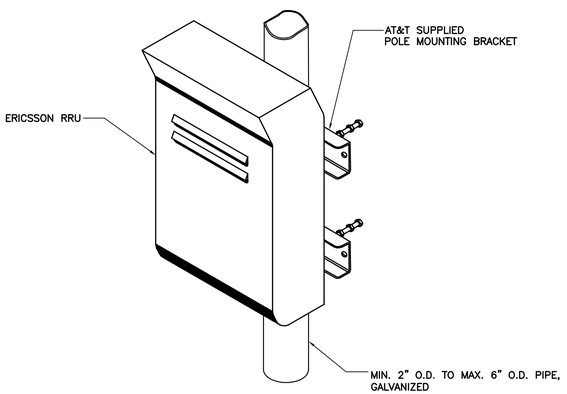


RRUS A2 SINGLE UNIT MOUNTING

THE UPPER AND LOWER POLE OR MAST MOUNTS DIFFER, BE SURE TO CORRECTLY POSITION THE MOUNTS BEFORE INSTALLATION.

1 N−1 ERICSSON RRU A2 DETAILS

NOT TO SCALE



ISOMETRIC VIEW

NOTES:

1. AT&T SHALL SUPPLY RRU, AND RRU POLE−MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE−MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

2 N−1 TYPICAL RRUS MOUNTING DETAILS

SCALE: NTS

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2003 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 F−96 (ANTENNA MOUNTS): 85 MPH (FASTEST MILE), EQUIVALENT TO 105 MPH (3 SECOND GUST)
   - BUILDING CLASSIFICATION: II (BASED ON IBC TABLE 1604.5)
   - BASIC WIND SPEED (OTHER STRUCTURE): 110 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7−02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENT.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7−02 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF−SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON CL&P OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   - A. STRUCTURAL STEEL (W SHAPES)−−−ASTM A992 (FY = 50 KSI)
   - B. STRUCTURAL STEEL (OTHER SHAPES)−−−ASTM A36 (FY = 36 KSI)
   - C. STRUCTURAL HSS (RECTANGULAR SHAPES)−−−ASTM A500 GRADE B, (FY = 46 KSI)
   - D. STRUCTURAL HSS (ROUND SHAPES)−−−ASTM A500 GRADE B, (FY = 42 KSI)
   - E. PIPE−−−ASTM A53 (FY = 35 KSI)
   - F. CONNECTION BOLTS−−−ASTM A325−N
   - G. U−BOLTS−−−ASTM A36
   - H. ANCHOR RODS−−−ASTM F 1554
   - I. WELDING ELECTRODE−−−ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON−GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT−DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

1. ANTENNA PANELS:
   - A. SHERWIN WILLIAMS POLANE−B
   - B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
2. COAXIAL CABLES:
   - A. ONE COAT OF DTM BONDING PRIMER (2−5 MILS. DRY FINISH)
   - B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5−5 MILS. DRY FINISH)
   - C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI−SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH−PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON−PETROLEUM−BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

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ORANGE, CT 06477

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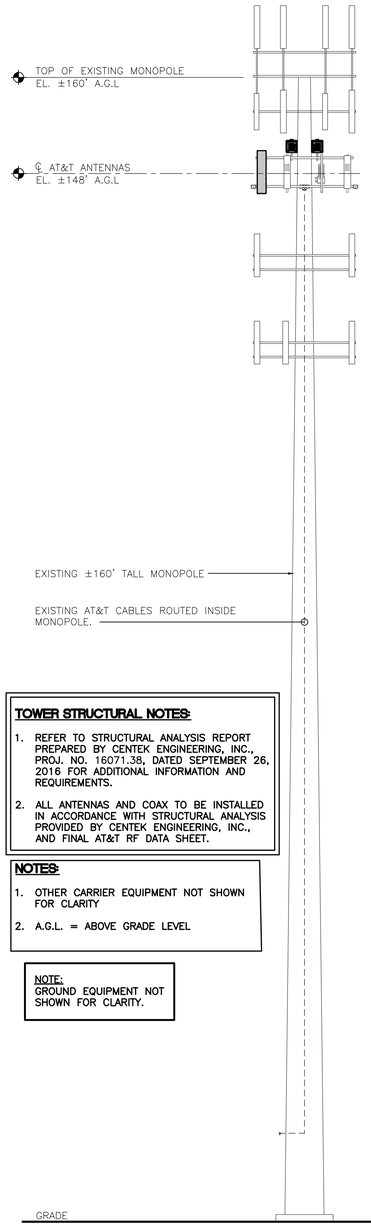
SCALE: AS NOTED
JOB NO. 16071.38

NOTES, SPECIFICATIONS AND DETAILS

N−1

Sheet No. 2 of 7



TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 16071.38, DATED SEPTEMBER 26, 2016 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC., AND FINAL AT&T RF DATA SHEET.

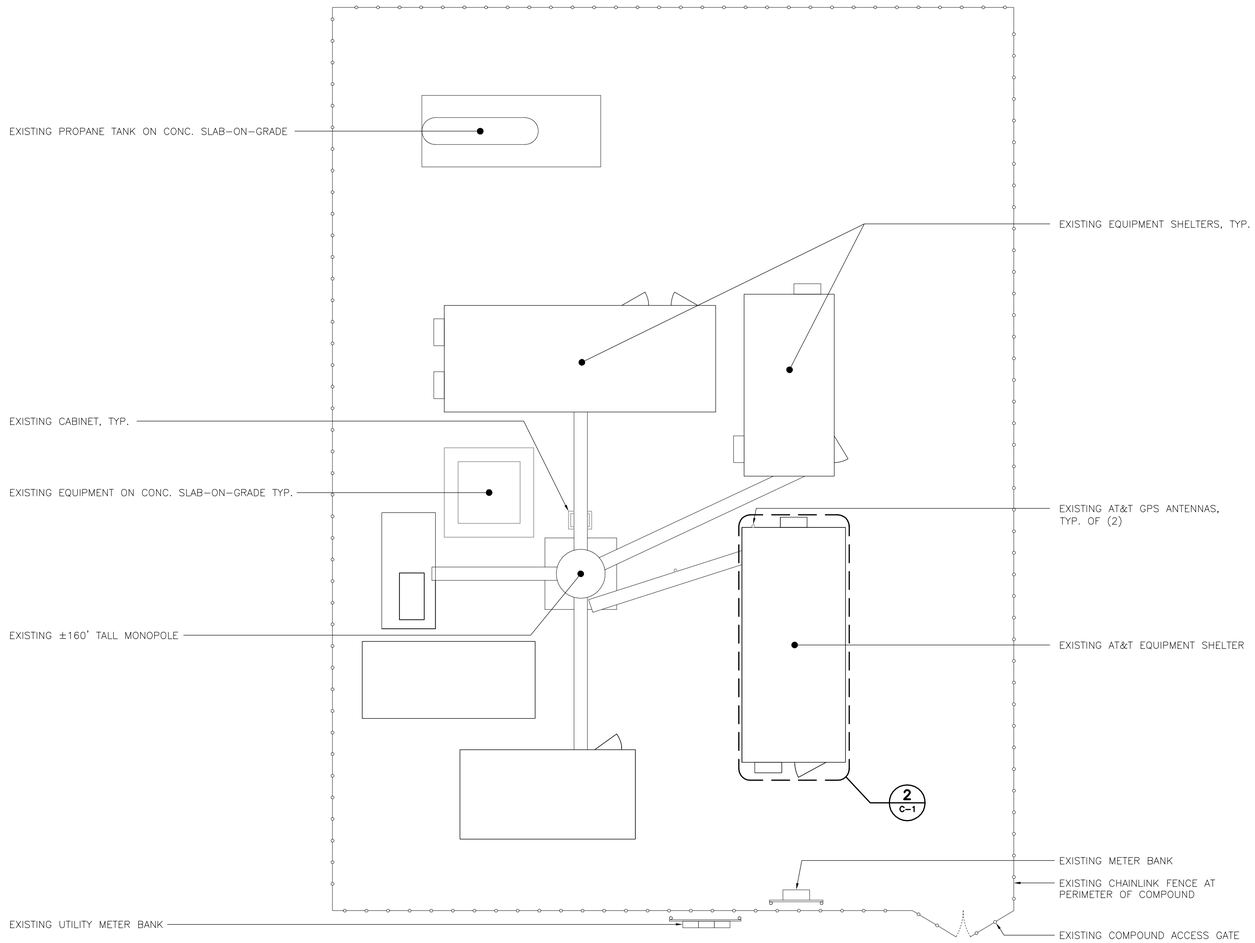
NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
2. A.G.L. = ABOVE GRADE LEVEL

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

3 C–1 **TOWER ELEVATION**
SCALE: 1" = 10'

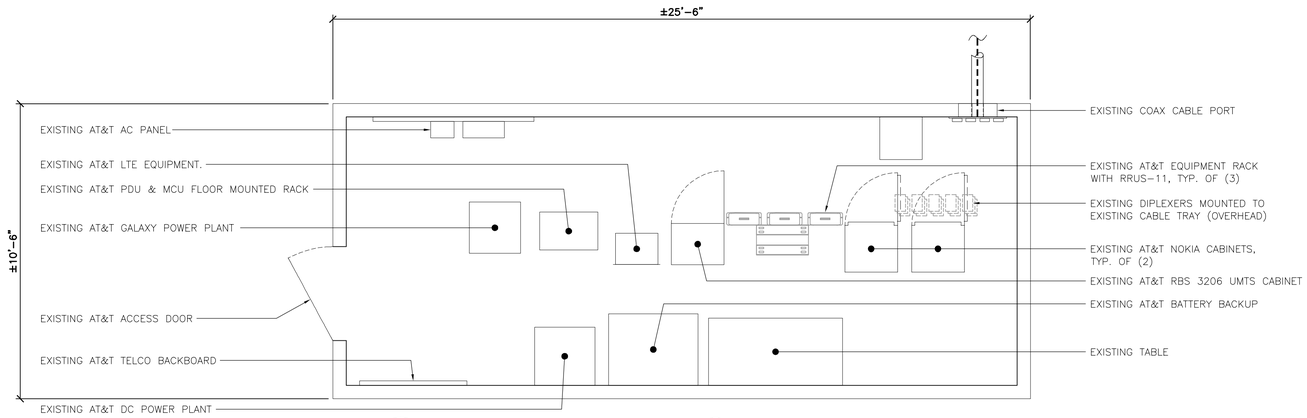
GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



1 C–1 **COMPOUND PLAN**
SCALE: 1/8" = 1'–0"

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

TRUE NORTH



2 C–1 **EQUIPMENT LAYOUT PLAN**
SCALE: 3/8" = 1'–0"

TRUE NORTH

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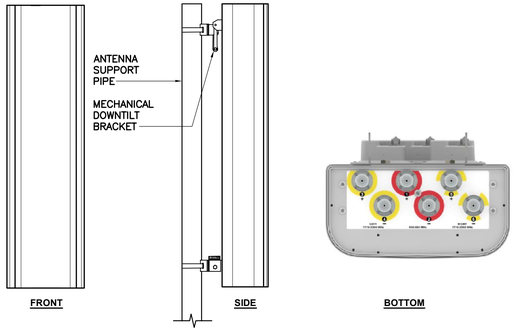
PLANS AND ELEVATION

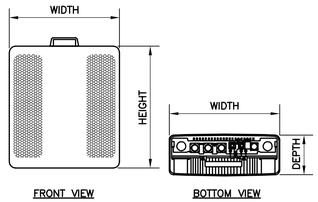
C–1

Sheet No. 3 of 7



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: HPA-65R-BUU-H6	72.0"L x 14.8"W x 9.0"D	51.0 LBS.

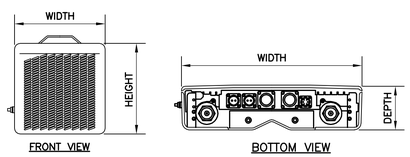
5 / C-2 PROPOSED ANTENNA DETAIL
SCALE: 1/2" = 1'-0"



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 12	20.4"L x 18.5"W x 7.5"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

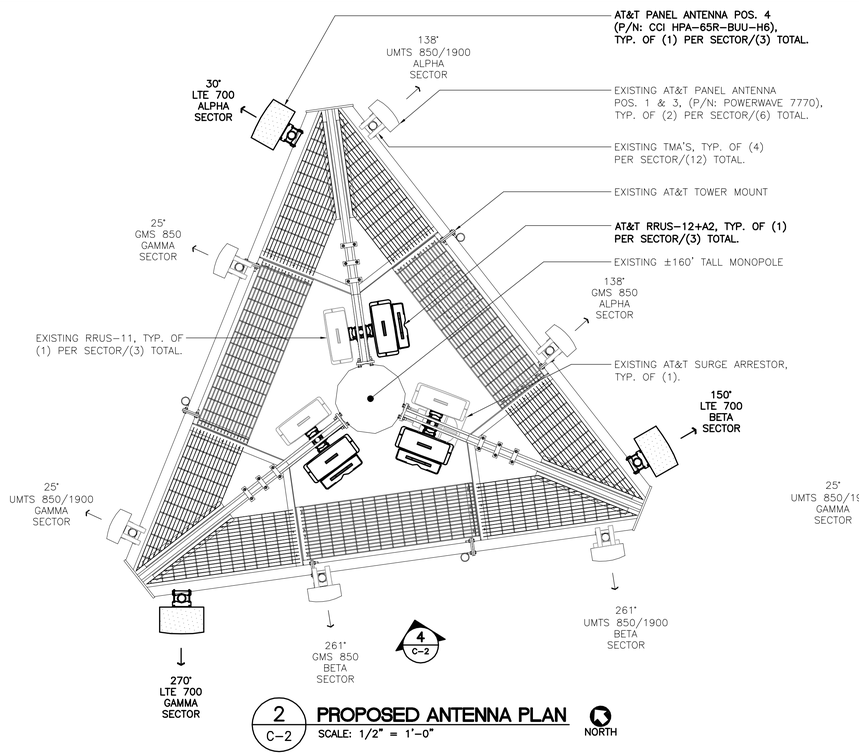
6 / C-2 ERICSSON RRUS 12 DETAIL
SCALE: 1" = 1'-0"



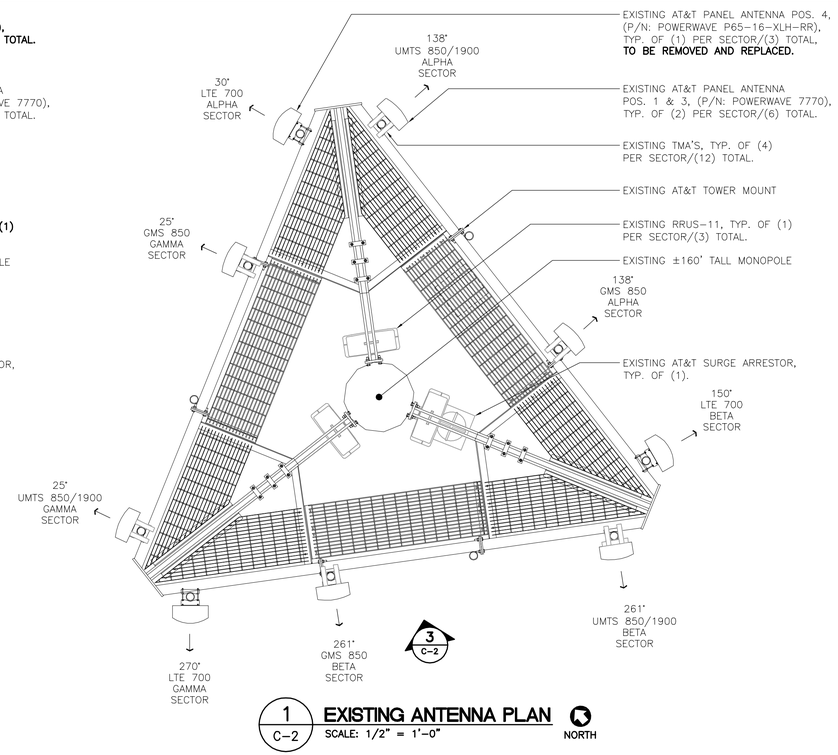
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS A2	16.42"L x 15.19"W x 3.35"D	22.05 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

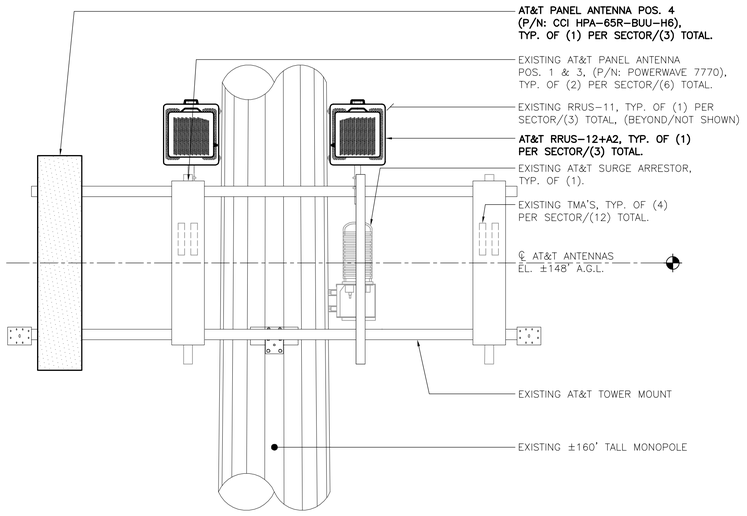
7 / C-2 ERICSSON RRUS A2 DETAIL
SCALE: 1" = 1'-0"



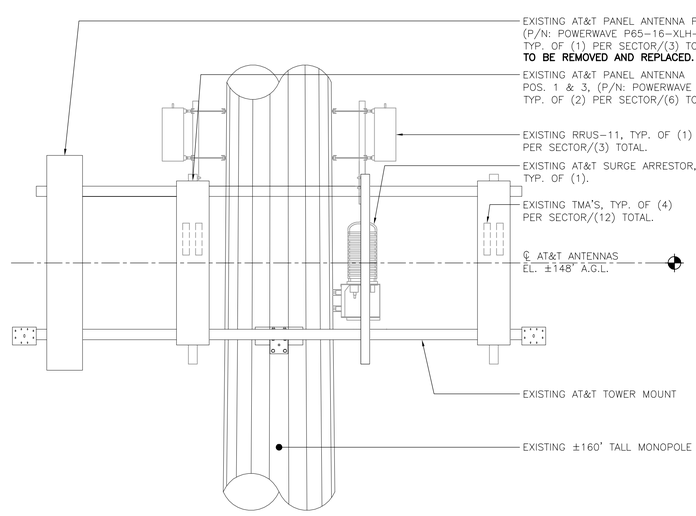
2 / C-2 PROPOSED ANTENNA PLAN
SCALE: 1/2" = 1'-0"



1 / C-2 EXISTING ANTENNA PLAN
SCALE: 1/2" = 1'-0"



4 / C-2 PROPOSED ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"



3 / C-2 EXISTING ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"

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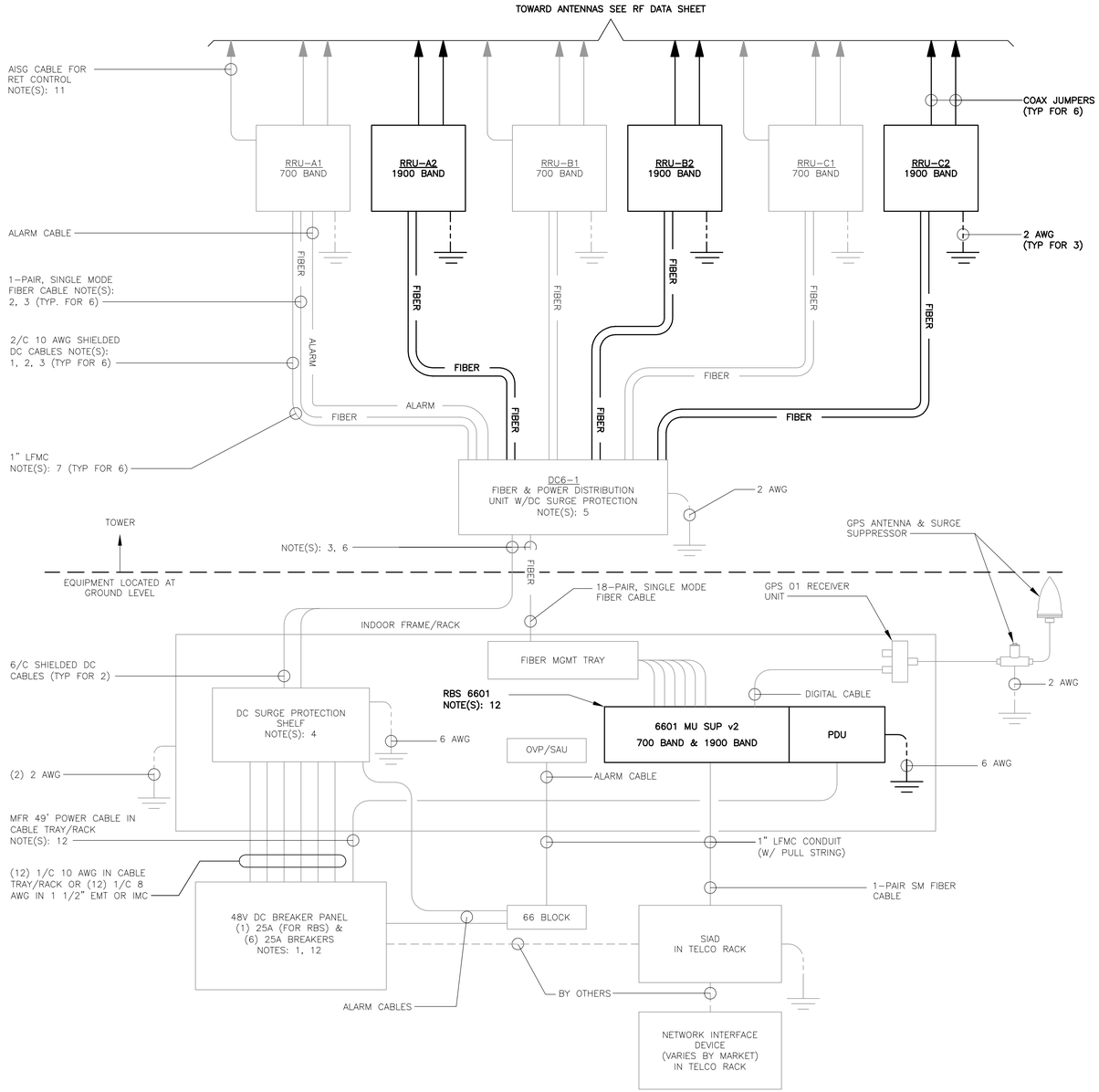
LTE 2C EQUIPMENT DETAILS

C-2

Sheet No. 4 of 7



1 / E-1 LTE SCHEMATIC DIAGRAM

NOT TO SCALE

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

   TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

   THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

   1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
   2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
   3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	09/27/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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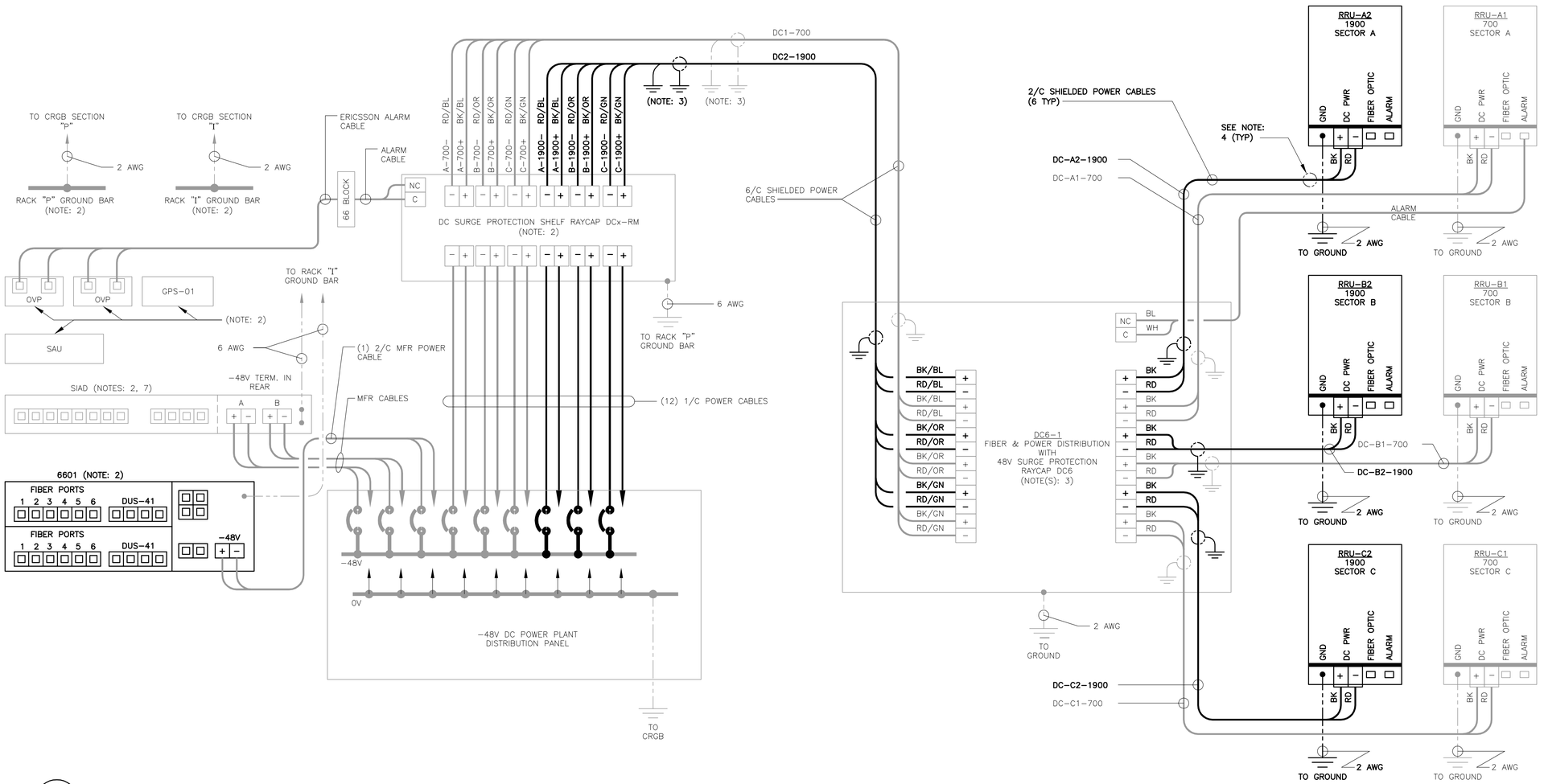
WIRELESS COMMUNICATIONS FACILITY
ORANGE
CT2174 - LTE 2C
525 ORANGE CENTER ROAD
ORANGE, CT 06477

DATE:	09/24/16
SCALE:	AS NOTED
JOB NO.	16071.38

LTE SCHEMATIC DIAGRAM AND NOTES

E-1

Sheet No. 5 of 7



1 / E-2 LTE WIRING DIAGRAM

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

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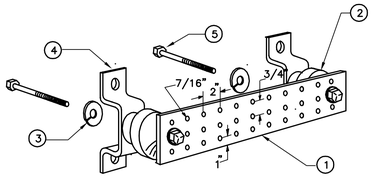
LTE WIRING DIAGRAM

E-2

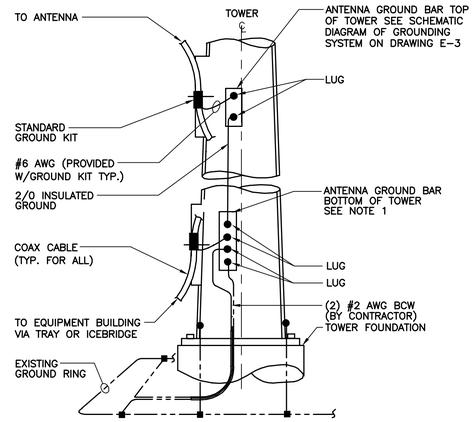
Sheet No. 6 of 7



LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

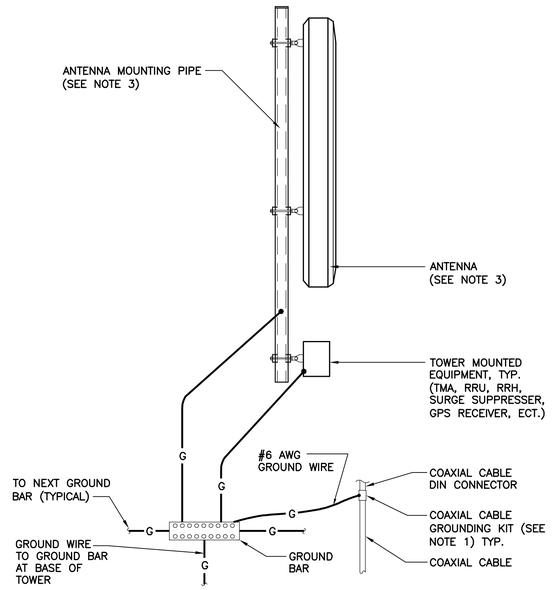
3 GROUND BAR DETAIL
E-3 NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

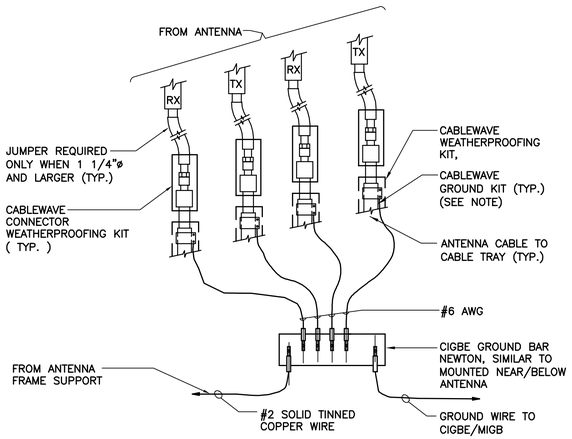
2 ANTENNA CABLE GROUNDING - TOWER
E-3 NOT TO SCALE



NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

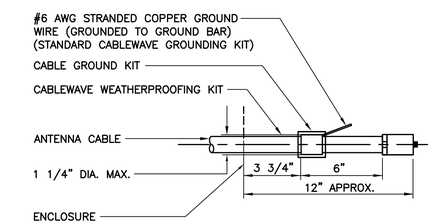
1 TYPICAL ANTENNA GROUNDING DETAIL
E-3 NOT TO SCALE



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

5 CONNECTION OF GROUND WIRES TO GROUND BAR
E-3 NOT TO SCALE



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

4 ANTENNA CABLE GROUNDING DETAIL
E-3 NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 7 of 7

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

160-ft Existing Valmont Monopole

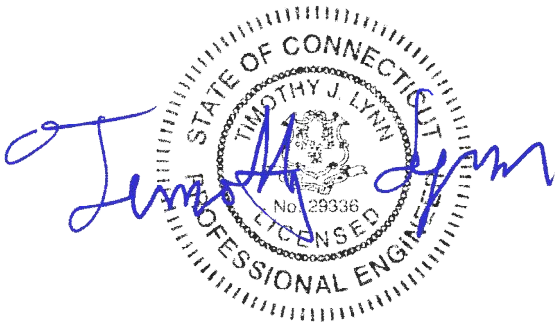
Proposed AT&T Mobilty
Antenna Upgrade

AT&T Site Ref: CT2174

525 Orange Center Road
Orange, CT

CENTEK Project No. 16071.38

Date: September 26, 2016



Prepared for:
AT&T Mobility
500 Enterprise Drive, Suite 3A
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Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by AT&T on the existing monopole (tower) located in Orange, CT.

The host tower is a 160-ft tall, four-section, twelve sided, tapered monopole, originally designed and manufactured by Valmont Structures job no; 16632-97, dated February 25, 1998. The manufacturer's drawings and calculations were unavailable for use in this report. The tower geometry, structure member sizes and foundation system information were obtained from a previous structural analysis report prepared by Centek; job no; 13001.040, dated November 7, 2013.

Antenna and appurtenance information were obtained from the aforementioned structural report prepared by Centek, a previous structural report prepared by Destek Engineering job no. 1664037 dated May 25, 2016, visual verification from grade by Centek personnel on July 27, 2016 and AT&T RF data sheet.

The tower is made up of four (4) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 21.2-in at the top and 64.0-in at the base.

AT&T proposes the removal of three (3) panel antennas and the installation of three (3) panel antennas and three (3) remote radio heads mounted on the existing 13-ft platform with handrails. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- NEXTEL (Existing):
  Antennas: Nine (9) Decibel DB844H90E-M panel antennas pipe mounted to Verizon's platform w/ handrails with a RAD center elevation of 167-ft above the existing tower base plate.
  Coax Cables: Nine (9) 1-1/4" ∅ coax cables running on the inside of the existing tower.
- CLEARWIRE (Existing):
  Antennas: Three (3) Argus LLPX310R panel antennas w/ Samsung WiMax remote radio heads, two (2) Andrew VHLP2-11-DW1 dish antennas and one (1) GPS antenna pipe mounted to Verizon's platform with rails with a RAD center elevation of 167-ft above the existing tower base plate.
  Coax Cables: Two (2) 2" ∅ flex conduits and three (3) 1/2" ∅ coax cables running on the inside of the existing tower.

- VERIZON (Existing):
  Antennas: Three (3) Antel BXA-70063-6CF panel antennas, six (6) Antel LPA-80060-6CF panel antennas, six (6) BXA-171063-12BF panel antennas, three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Head, one (1) RFS DB-T1-6Z-8AB-0Z main distribution box and six (6) RFS FD9R6004/2C-3L diplexers mounted on a 13-ft platform with rails with a RAD center elevation of 158-ft above the existing tower base plate.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on the inside of the existing tower.
- SPRINT (Existing):
  Antennas: Three (3) RFS APXVSPP18 panel antennas, three (3) RFS APXVTM14 panel antennas, three (3) 800MHz RRH, three (3) 1900MHz RRH and three (3) TD-RRH-8x20 remote radio heads mounted on a 13-ft platform with rails with a RAD center elevation of 138-ft above the existing tower base plate.
  Coax Cables: Three (3) 1-1/4" ∅ fiber cables running on the inside of the existing tower.
- T-MOBILE (Existing):
  Antennas: Three (3) Andrew LNX-6515DS panel antennas, three (3) Ericsson AIR21 B2A/B4P panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) Ericsson RRUS-11 remote radio heads and three (3) TMA's mounted on a 13-ft platform with rails with a RAD center elevation of 123-ft above the existing tower base plate.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and two (2) 1-1/4" ∅ fiber cables running on the inside of the existing tower and six (6) 1-5/8" ∅ coax cables running on the exterior of the existing monopole.
- SPRINT (Existing):
  Antennas: One (1) GPS antenna on a GPS Stand-off mount with a RAD center elevation of 76-ft above grade.
  Coax Cables: One (1) 1/2"∅ coax cable running on the inside of the existing tower.
- AT&T (Existing to Remain):
  Antennas: Six (6) Powerwave 7770 panel antennas and twelve (12) Powerwave LGP21401 TMA's mounted on a 13-ft platform with rails with a RAD center elevation of 148-ft above grade.
  Appurtenances: Three (3) Ericsson RRUS-11 and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted to one (1) universal ring mount with a RAD center elevation of 150-ft above grade level.
  Coax Cables: Twelve (12) 1-1/4" ∅ coax cables, one (1) fiber trunk and two (2) DC trunks running on the inside of the existing tower.
- AT&T (Existing to Remove):
  Antennas: Three (3) Powerwave P65-16-XLH-RR panel antennas mounted on a 13-ft platform with rails with a RAD center elevation of 148-ft above grade.

- **AT&T (Proposed):**
  Antennas: Three (3) CCI HPA-65R-BUU-H6 panel antennas mounted on a 13-ft platform with rails with a RAD center elevation of 148-ft above grade.
  Appurtenances: Three (3) Ericsson RRUS-12 and three (3) Ericsson A2s mounted to one (1) universal ring mount with a RAD center elevation of 150-ft above grade level.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All existing coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	New Haven; v = 95-115 mph (3-second gust)	*[Annex B of TIA-222-G-2005]*
	Orange; v = 97 mph (3 second gust)	*[Appendix N of the 2016 CT Building Code]*
Load Cases:	Load Case 1; 97 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2012 International Building Code as amended by the 2016 Connecticut State Building Code (CSBC).

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Design flexural strength was determined based on section 4.7 and Table 4-8 of the TIA-222-G.

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **77.7%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L4)	0'-37.17'	77.7%	**PASS**

Foundation and Anchors

The existing foundation consists of an 8.0-ft square x 10.0-ft long reinforced concrete pier on a 22.0-ft x4.0-ft thick reinforce concrete pad. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned structural report prepared by Centek. The base of the tower is connected to the foundation by means of (24) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 10-ft into the concrete foundation structure.

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	52 kips
	Compression	66 kips
	Moment	5799 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinforced Concrete Pad and Pier	OTM[(2)]	1.0	2.18	**PASS**

Note 1: FS denotes Factor of Safety.
Note 2: OTM denotes Overturning Moment.

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Axial and Shear	64.1%	**PASS**
Base Plate	Bending	38.0%	**PASS**

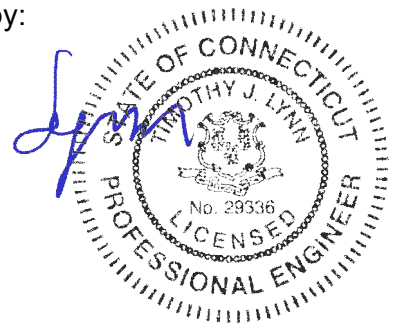
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

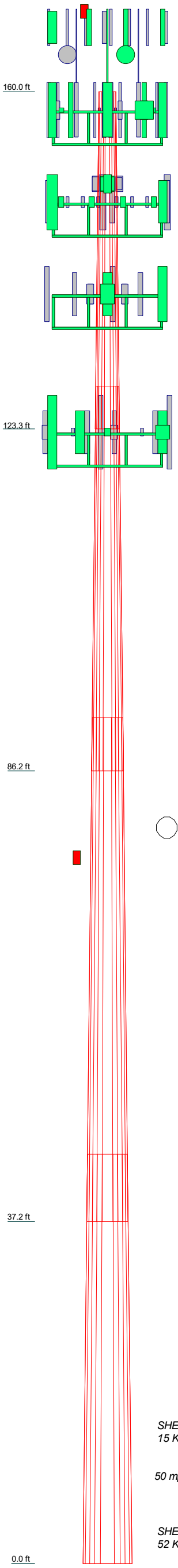
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

TnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, TnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

TnxTower Features:

- TnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- TnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	36.670	12	0.219	4.670	21.200	31.460	A572-65	2.3
2	41.830	12	0.344	5.830	29.715	41.440	A572-65	5.6
3	54.830	12	0.438	7.330	39.118	54.460	A572-65	12.2
4	44.500	12	0.469		51.533	64.000	A572-65	13.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
GPS (Clearwire - Existing)	168	RRUS-11 (AT⌶ - Existing)	150
DB844H90E-M (Nextel - Existing)	167	DC6-48-60-18-8F Surge Arrestor (AT⌶ - Existing)	150
DB844H90E-M (Nextel - Existing)	167	Valmont Uni-Tri Bracket (AT⌶ - Existing)	150
DB844H90E-M (Nextel - Existing)	167	7770.00 (AT⌶ - Existing)	148
DB844H90E-M (Nextel - Existing)	167	7770.00 (AT⌶ - Existing)	148
DB844H90E-M (Nextel - Existing)	167	(4) LGP21401 TMA (AT⌶ - Existing)	148
DB844H90E-M (Nextel - Existing)	167	HPA-65R-BUU-H6 (AT⌶ - Proposed)	148
DB844H90E-M (Nextel - Existing)	167	HPA-65R-BUU-H6 (AT⌶ - Proposed)	148
DB844H90E-M (Nextel - Existing)	167	HPA-65R-BUU-H6 (AT⌶ - Proposed)	148
DB844H90E-M (Nextel - Existing)	167	(4) LGP21401 TMA (AT⌶ - Existing)	148
LLPX310R (Clearwire - Existing)	167	(4) LGP21401 TMA (AT⌶ - Existing)	148
LLPX310R (Clearwire - Existing)	167	7770.00 (AT⌶ - Existing)	148
LLPX310R (Clearwire - Existing)	167	7770.00 (AT⌶ - Existing)	148
RRU (Clearwire - Existing)	167	7770.00 (AT⌶ - Existing)	148
RRU (Clearwire - Existing)	167	7770.00 (AT⌶ - Existing)	148
RRU (Clearwire - Existing)	167	13' Platform w/Rails (AT⌶ - Existing)	146
(4) 8'x2 1/2" Pipe Mount (Nextel - Existing)	165	APXVSPP18-C-A20 (Sprint - Existing)	138
(4) 8'x2 1/2" Pipe Mount (Nextel - Existing)	165	APXVTM14 (Sprint - Existing)	138
(4) 8'x2 1/2" Pipe Mount (Nextel - Existing)	165	APXVSPP18-C-A20 (Sprint - Existing)	138
VHLP2-11-DW1 (Clearwire - Existing)	164	APXVTM14 (Sprint - Existing)	138
VHLP2-11-DW1 (Clearwire - Existing)	164	APXVSPP18-C-A20 (Sprint - Existing)	138
BXA-171063-12BF (Verizon - Existing)	158	FD-RRH 2x50 800 (Sprint - Existing)	138
BXA-70063/6CF (Verizon - Existing)	158	FD-RRH 2x50 800 (Sprint - Existing)	138
LPA-80060-6CF (Verizon - Existing)	158	FD-RRH 2x50 800 (Sprint - Existing)	138
LPA-80060-6CF (Verizon - Existing)	158	FD-RRH 4x45 1900 (Sprint - Existing)	138
BXA-171063-12BF (Verizon - Existing)	158	FD-RRH 4x45 1900 (Sprint - Existing)	138
BXA-70063/6CF (Verizon - Existing)	158	FD-RRH 4x45 1900 (Sprint - Existing)	138
LPA-80060-6CF (Verizon - Existing)	158	TD-RRH8x20-25 (Sprint - Existing)	138
LPA-80060-6CF (Verizon - Existing)	158	TD-RRH8x20-25 (Sprint - Existing)	138
BXA-171063-12BF (Verizon - Existing)	158	TD-RRH8x20-25 (Sprint - Existing)	138
BXA-70063/6CF (Verizon - Existing)	158	APXVTM14 (Sprint - Existing)	138
LPA-80060-6CF (Verizon - Existing)	158	13' Platform w/Rails (Sprint - Existing)	136
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	158	LNX-6515DS (T-Mobile - Existing)	123
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	158	AIR21 B2A/B4P (T-Mobile - Existing)	123
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	158	AIR32 (T-Mobile - Existing)	123
BXA-171063-12BF (Verizon - Existing)	158	LNX-6515DS (T-Mobile - Existing)	123
BXA-171063-12BF (Verizon - Existing)	158	AIR21 B2A/B4P (T-Mobile - Existing)	123
BXA-171063-12BF (Verizon - Existing)	158	AIR32 (T-Mobile - Existing)	123
RRH2x40-AWS (Verizon - Existing)	158	LNX-6515DS (T-Mobile - Existing)	123
RRH2x40-AWS (Verizon - Existing)	158	TMA 10"x8"x3" (T-Mobile - Existing)	123
RRH2x40-AWS (Verizon - Existing)	158	TMA 10"x8"x3" (T-Mobile - Existing)	123
DB-T1-6Z-8AB-0Z (Verizon - Existing)	158	TMA 10"x8"x3" (T-Mobile - Existing)	123
LPA-80060-6CF (Verizon - Existing)	158	RRUS-11 (T-Mobile - Existing)	123
13' Platform w/Rails (Verizon - Existing)	156	RRUS-11 (T-Mobile - Existing)	123
RRUS-12 (AT⌶ - Proposed)	150	RRUS-11 (T-Mobile - Existing)	123
RRUS-12 (AT⌶ - Proposed)	150	AIR32 (T-Mobile - Existing)	123
RRUS-12 (AT⌶ - Proposed)	150	AIR21 B2A/B4P (T-Mobile - Existing)	123
A2 (AT⌶ - Proposed)	150	13' Platform w/Rails (T-Mobile - Existing)	121
A2 (AT⌶ - Proposed)	150	GPS (Sprint - Existing)	76
A2 (AT⌶ - Proposed)	150	Stand-off	75
RRUS-11 (AT⌶ - Existing)	150	Stand-off	75
RRUS-11 (AT⌶ - Existing)	150		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. TOWER RATING: 77.7%

ALL REACTIONS ARE FACTORED

AXIAL 114 K
SHEAR 15 K *MOMENT 1828 kip-ft*
TORQUE 0 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 66 K
SHEAR 52 K *MOMENT 5799 kip-ft*
TORQUE 1 kip-ft
REACTIONS - 97 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **16071.38 - CT2174**			
Project: **160-ft Valmont Monopole - 525 Orange Center Rd., Orange, CT**			
Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 09/26/16	Scale: NTS	
Path: J:\Jobs\1607100.W\38_Orange,CT CT2174\04_Structural\Backup Documentation\CalcsER\Res\160' Monopole_Orange_CT.eri		Dwg No. E-1	

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification		Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks		Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	160.000-123.330	36.670	4.670	12	21.200	31.460	0.219	0.876	A572-65 (65 ksi)
L2	123.330-86.170	41.830	5.830	12	29.715	41.440	0.344	1.376	A572-65 (65 ksi)
L3	86.170-37.170	54.830	7.330	12	39.118	54.460	0.438	1.752	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L4	37.170-0.000	44.500		12	51.533	64.000	0.469	1.876	(65 ksi) A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	21.948	14.795	831.313	7.511	10.982	75.701	1684.465	7.282	5.095	23.263
	32.570	22.031	2744.484	11.184	16.296	168.412	5561.069	10.843	7.844	35.819
L2	32.119	32.534	3582.389	10.515	15.393	232.735	7258.892	16.012	7.042	20.47
	42.902	45.521	9812.935	14.712	21.466	457.140	19883.667	22.404	10.184	29.605
L3	42.187	54.553	10417.699	13.847	20.263	514.122	21109.082	26.849	9.310	21.255
	56.381	76.190	28381.014	19.340	28.210	1006.052	57507.629	37.499	13.421	30.643
L4	55.477	77.116	25666.021	18.281	26.694	961.487	52006.317	37.954	12.554	26.767
	66.258	95.943	49427.852	22.744	33.152	1490.946	100154.229	47.220	15.895	33.891

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.000-123.330				1	1	1			
L2 123.330-86.170				1	1	1			
L3 86.170-37.170				1	1	1			
L4 37.170-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1 1/4 (Nextel - Existing)	A	No	Inside Pole	160.000 - 3.000	9	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
2" dia Flex Conuit (Clearwire - Existing)	A	No	Inside Pole	160.000 - 3.000	2	No Ice	0.000	0.005
						1/2" Ice	0.000	0.005
						1" Ice	0.000	0.005
1/2 (Clearwire - Existing)	A	No	Inside Pole	160.000 - 3.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
1 5/8 (Verizon - Existing)	B	No	Inside Pole	156.000 - 3.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
HYBRIFLEX 1-5/8" (Verizon - Existing)	B	No	Inside Pole	156.000 - 3.000	1	No Ice	0.000	0.002
						1/2" Ice	0.000	0.002

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1" Ice	0.000	0.002
1 1/4	C	No	Inside Pole	146.000 - 3.000	12	No Ice	0.000	0.001
(AT&T - Existing)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
RG6-Fiber	C	No	Inside Pole	150.000 - 3.000	1	No Ice	0.000	0.001
(AT&T - Existing)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
#8 AWG Copper WIre	C	No	Inside Pole	150.000 - 3.000	2	No Ice	0.000	0.000
(AT&T - Existing)						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
HYBRIFLEX 1-1/4"	A	No	Inside Pole	136.000 - 3.000	3	No Ice	0.000	0.001
(Sprint - Existing)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
1 5/8	B	No	Inside Pole	123.000 - 3.000	12	No Ice	0.000	0.001
(T-Mobile - Existing)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
1 5/8	B	No	CaAa (Out Of Face)	123.000 - 3.000	1	No Ice	0.198	0.001
(T-Mobile - Existing)						1/2" Ice	0.298	0.003
						1" Ice	0.398	0.005
1 5/8	B	No	CaAa (Out Of Face)	123.000 - 3.000	5	No Ice	0.000	0.001
(T-Mobile - Existing)						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.005
HYBRIFLEX 1-1/4"	A	No	Inside Pole	123.000 - 3.000	2	No Ice	0.000	0.001
(T-Mobile - Existing)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
1/2	A	No	Inside Pole	75.000 - 3.000	1	No Ice	0.000	0.000
(Sprint - Existing)						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.000-123.330	A	0.000	0.000	0.000	0.000	0.661
		B	0.000	0.000	0.000	0.000	0.470
		C	0.000	0.000	0.000	0.000	0.209
L2	123.330-86.170	A	0.000	0.000	0.000	0.000	0.861
		B	0.000	0.000	0.000	7.292	1.224
		C	0.000	0.000	0.000	0.000	0.335
L3	86.170-37.170	A	0.000	0.000	0.000	0.000	1.146
		B	0.000	0.000	0.000	9.702	1.622
		C	0.000	0.000	0.000	0.000	0.442
L4	37.170-0.000	A	0.000	0.000	0.000	0.000	0.801
		B	0.000	0.000	0.000	6.766	1.131
		C	0.000	0.000	0.000	0.000	0.308

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.000-123.330	A	1.734	0.000	0.000	0.000	0.000	0.661
		B		0.000	0.000	0.000	0.000	0.470
		C		0.000	0.000	0.000	0.000	0.209

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L2	123.330-86.170	A	1.683	0.000	0.000	0.000	0.000	0.861
		B		0.000	0.000	0.000	20.065	3.015
		C		0.000	0.000	0.000	0.000	0.335
L3	86.170-37.170	A	1.595	0.000	0.000	0.000	0.000	1.146
		B		0.000	0.000	0.000	26.191	3.913
		C		0.000	0.000	0.000	0.000	0.442
L4	37.170-0.000	A	1.417	0.000	0.000	0.000	0.000	0.801
		B		0.000	0.000	0.000	17.666	2.620
		C		0.000	0.000	0.000	0.000	0.308

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(4) 8'x2 1/2" Pipe Mount (Nextel - Existing)	A	From Face	3.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice 1" Ice	2.300 3.132 3.620	2.300 3.132 3.620	0.041 0.057 0.080
(4) 8'x2 1/2" Pipe Mount (Nextel - Existing)	B	From Face	3.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice 1" Ice	2.300 3.132 3.620	2.300 3.132 3.620	0.041 0.057 0.080
(4) 8'x2 1/2" Pipe Mount (Nextel - Existing)	C	From Face	3.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice 1" Ice	2.300 3.132 3.620	2.300 3.132 3.620	0.041 0.057 0.080
DB844H90E-M (Nextel - Existing)	A	From Face	3.000 2.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	2.867 3.177 3.487	3.796 4.104 4.419	0.010 0.036 0.067
DB844H90E-M (Nextel - Existing)	A	From Face	3.000 -2.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	2.867 3.177 3.487	3.796 4.104 4.419	0.010 0.036 0.067
DB844H90E-M (Nextel - Existing)	A	From Face	3.000 -6.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	2.867 3.177 3.487	3.796 4.104 4.419	0.010 0.036 0.067
DB844H90E-M (Nextel - Existing)	B	From Face	3.000 2.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	2.867 3.177 3.487	3.796 4.104 4.419	0.010 0.036 0.067
DB844H90E-M (Nextel - Existing)	B	From Face	3.000 -2.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	2.867 3.177 3.487	3.796 4.104 4.419	0.010 0.036 0.067
DB844H90E-M (Nextel - Existing)	B	From Face	3.000 -6.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	2.867 3.177 3.487	3.796 4.104 4.419	0.010 0.036 0.067
DB844H90E-M (Nextel - Existing)	C	From Face	3.000 2.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	2.867 3.177 3.487	3.796 4.104 4.419	0.010 0.036 0.067

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
DB844H90E-M	C	From Face	3.000	0.000	167.000	No Ice	2.867	3.796	0.010
(Nextel - Existing)			-2.000			1/2" Ice	3.177	4.104	0.036
			0.000			1" Ice	3.487	4.419	0.067
DB844H90E-M	C	From Face	3.000	0.000	167.000	No Ice	2.867	3.796	0.010
(Nextel - Existing)			-6.000			1/2" Ice	3.177	4.104	0.036
			0.000			1" Ice	3.487	4.419	0.067
LLPX310R	A	From Face	3.000	0.000	167.000	No Ice	4.304	1.945	0.029
(Clearwire - Existing)			6.000			1/2" Ice	4.596	2.214	0.055
			0.000			1" Ice	4.896	2.489	0.084
LLPX310R	B	From Face	3.000	0.000	167.000	No Ice	4.304	1.945	0.029
(Clearwire - Existing)			6.000			1/2" Ice	4.596	2.214	0.055
			0.000			1" Ice	4.896	2.489	0.084
LLPX310R	C	From Face	3.000	0.000	167.000	No Ice	4.304	1.945	0.029
(Clearwire - Existing)			6.000			1/2" Ice	4.596	2.214	0.055
			0.000			1" Ice	4.896	2.489	0.084
RRU	A	From Face	3.000	0.000	167.000	No Ice	1.804	0.778	0.033
(Clearwire - Existing)			0.000			1/2" Ice	2.000	0.920	0.045
			0.000			1" Ice	2.196	1.062	0.057
RRU	A	From Face	3.000	0.000	167.000	No Ice	1.804	0.778	0.033
(Clearwire - Existing)			0.000			1/2" Ice	2.000	0.920	0.045
			0.000			1" Ice	2.196	1.062	0.057
RRU	A	From Face	3.000	0.000	167.000	No Ice	1.804	0.778	0.033
(Clearwire - Existing)			0.000			1/2" Ice	2.000	0.920	0.045
			0.000			1" Ice	2.196	1.062	0.057
GPS	A	From Face	2.000	0.000	168.000	No Ice	1.000	1.000	0.010
(Clearwire - Existing)			0.000			1/2" Ice	1.500	1.500	0.015
			0.000			1" Ice	2.000	2.000	0.020
13' Platform w/Rails	C	None		0.000	156.000	No Ice	17.200	17.200	2.000
(Verizon - Existing)						1/2" Ice	22.300	22.300	3.000
						1" Ice	83.000	83.000	4.000
LPA-80060-6CF	A	From Face	3.000	0.000	158.000	No Ice	6.527	6.758	0.022
(Verizon - Existing)			6.000			1/2" Ice	6.987	7.215	0.072
			0.000			1" Ice	7.443	7.663	0.127
BXA-171063-12BF	A	From Face	3.000	0.000	158.000	No Ice	4.734	3.572	0.015
(Verizon - Existing)			4.000			1/2" Ice	5.180	4.007	0.042
			0.000			1" Ice	5.633	4.450	0.075
BXA-70063/6CF	A	From Face	3.000	0.000	158.000	No Ice	7.569	4.158	0.012
(Verizon - Existing)			0.000			1/2" Ice	8.016	4.595	0.054
			0.000			1" Ice	8.470	5.040	0.103
LPA-80060-6CF	A	From Face	3.000	0.000	158.000	No Ice	6.527	6.758	0.022
(Verizon - Existing)			-6.000			1/2" Ice	6.987	7.215	0.072
			0.000			1" Ice	7.443	7.663	0.127
LPA-80060-6CF	B	From Face	3.000	0.000	158.000	No Ice	6.527	6.758	0.022
(Verizon - Existing)			6.000			1/2" Ice	6.987	7.215	0.072
			0.000			1" Ice	7.443	7.663	0.127
BXA-171063-12BF	B	From Face	3.000	0.000	158.000	No Ice	4.734	3.572	0.015
(Verizon - Existing)			4.000			1/2" Ice	5.180	4.007	0.042
			0.000			1" Ice	5.633	4.450	0.075
BXA-70063/6CF	B	From Face	3.000	0.000	158.000	No Ice	7.569	4.158	0.012
(Verizon - Existing)			0.000			1/2" Ice	8.016	4.595	0.054
			0.000			1" Ice	8.470	5.040	0.103
LPA-80060-6CF	B	From Face	3.000	0.000	158.000	No Ice	6.527	6.758	0.022
(Verizon - Existing)			-6.000			1/2" Ice	6.987	7.215	0.072
			0.000			1" Ice	7.443	7.663	0.127
LPA-80060-6CF	C	From Face	3.000	0.000	158.000	No Ice	6.527	6.758	0.022
(Verizon - Existing)			6.000			1/2" Ice	6.987	7.215	0.072
			0.000			1" Ice	7.443	7.663	0.127

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-171063-12BF	C	From Face	3.000		0.000	158.000	No Ice	4.734	3.572	0.015
(Verizon - Existing)			4.000				1/2" Ice	5.180	4.007	0.042
			0.000				1" Ice	5.633	4.450	0.075
BXA-70063/6CF	C	From Face	3.000		0.000	158.000	No Ice	7.569	4.158	0.012
(Verizon - Existing)			0.000				1/2" Ice	8.016	4.595	0.054
			0.000				1" Ice	8.470	5.040	0.103
LPA-80060-6CF	C	From Face	3.000		0.000	158.000	No Ice	6.527	6.758	0.022
(Verizon - Existing)			-6.000				1/2" Ice	6.987	7.215	0.072
			0.000				1" Ice	7.443	7.663	0.127
(2) FD9R6004/2C-3L	A	From Face	3.000		0.000	158.000	No Ice	0.314	0.076	0.003
Diplexer			0.000				1/2" Ice	0.386	0.119	0.005
(Verizon - Existing)			0.000				1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	B	From Face	3.000		0.000	158.000	No Ice	0.314	0.076	0.003
Diplexer			0.000				1/2" Ice	0.386	0.119	0.005
(Verizon - Existing)			0.000				1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	C	From Face	3.000		0.000	158.000	No Ice	0.314	0.076	0.003
Diplexer			0.000				1/2" Ice	0.386	0.119	0.005
(Verizon - Existing)			0.000				1" Ice	0.466	0.169	0.009
BXA-171063-12BF	A	From Face	3.000		0.000	158.000	No Ice	4.734	3.572	0.015
(Verizon - Existing)			-4.000				1/2" Ice	5.180	4.007	0.042
			0.000				1" Ice	5.633	4.450	0.075
BXA-171063-12BF	B	From Face	3.000		0.000	158.000	No Ice	4.734	3.572	0.015
(Verizon - Existing)			-4.000				1/2" Ice	5.180	4.007	0.042
			0.000				1" Ice	5.633	4.450	0.075
BXA-171063-12BF	C	From Face	3.000		0.000	158.000	No Ice	4.734	3.572	0.015
(Verizon - Existing)			-4.000				1/2" Ice	5.180	4.007	0.042
			0.000				1" Ice	5.633	4.450	0.075
RRH2x40-AWS	A	From Face	3.000		0.000	158.000	No Ice	2.161	1.420	0.044
(Verizon - Existing)			-4.000				1/2" Ice	2.360	1.590	0.061
			0.000				1" Ice	2.565	1.768	0.082
RRH2x40-AWS	B	From Face	3.000		0.000	158.000	No Ice	2.161	1.420	0.044
(Verizon - Existing)			-4.000				1/2" Ice	2.360	1.590	0.061
			0.000				1" Ice	2.565	1.768	0.082
RRH2x40-AWS	C	From Face	3.000		0.000	158.000	No Ice	2.161	1.420	0.044
(Verizon - Existing)			-4.000				1/2" Ice	2.360	1.590	0.061
			0.000				1" Ice	2.565	1.768	0.082
DB-T1-6Z-8AB-0Z	C	From Face	3.000		0.000	158.000	No Ice	4.800	2.000	0.044
(Verizon - Existing)			-4.000				1/2" Ice	5.070	2.193	0.080
			0.000				1" Ice	5.348	2.393	0.120
13' Platform w/Rails	C	None			0.000	146.000	No Ice	17.200	17.200	2.000
(AT&T - Existing)							1/2" Ice	22.300	22.300	3.000
							1" Ice	83.000	83.000	4.000
7770.00	A	From Face	3.000		0.000	148.000	No Ice	5.508	2.928	0.035
(AT&T - Existing)			6.000				1/2" Ice	5.867	3.273	0.068
			0.000				1" Ice	6.233	3.625	0.105
7770.00	A	From Face	3.000		0.000	148.000	No Ice	5.508	2.928	0.035
(AT&T - Existing)			-6.000				1/2" Ice	5.867	3.273	0.068
			0.000				1" Ice	6.233	3.625	0.105
7770.00	B	From Face	3.000		0.000	148.000	No Ice	5.508	2.928	0.035
(AT&T - Existing)			6.000				1/2" Ice	5.867	3.273	0.068
			0.000				1" Ice	6.233	3.625	0.105
7770.00	B	From Face	3.000		0.000	148.000	No Ice	5.508	2.928	0.035
(AT&T - Existing)			-6.000				1/2" Ice	5.867	3.273	0.068
			0.000				1" Ice	6.233	3.625	0.105
7770.00	C	From Face	3.000		0.000	148.000	No Ice	5.508	2.928	0.035
(AT&T - Existing)			6.000				1/2" Ice	5.867	3.273	0.068
			0.000				1" Ice	6.233	3.625	0.105

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
7770.00	C	From Face	3.000	0.000	148.000	No Ice	5.508	2.928	0.035
(AT&T - Existing)			-6.000			1/2" Ice	5.867	3.273	0.068
			0.000			1" Ice	6.233	3.625	0.105
(4) LGP21401 TMA	A	From Face	3.000	0.000	148.000	No Ice	0.817	0.346	0.018
(AT&T - Existing)			0.000			1/2" Ice	0.937	0.440	0.023
			0.000			1" Ice	1.065	0.540	0.031
(4) LGP21401 TMA	B	From Face	3.000	0.000	148.000	No Ice	0.817	0.346	0.018
(AT&T - Existing)			0.000			1/2" Ice	0.937	0.440	0.023
			0.000			1" Ice	1.065	0.540	0.031
(4) LGP21401 TMA	C	From Face	3.000	0.000	148.000	No Ice	0.817	0.346	0.018
(AT&T - Existing)			0.000			1/2" Ice	0.937	0.440	0.023
			0.000			1" Ice	1.065	0.540	0.031
RRUS-12	A	From Face	0.500	0.000	150.000	No Ice	3.145	1.285	0.058
(AT&T - Proposed)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
RRUS-12	B	From Face	0.500	0.000	150.000	No Ice	3.145	1.285	0.058
(AT&T - Proposed)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
RRUS-12	C	From Face	0.500	0.000	150.000	No Ice	3.145	1.285	0.058
(AT&T - Proposed)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
A2	A	From Face	0.500	0.000	150.000	No Ice	2.077	0.505	0.022
(AT&T - Proposed)			0.000			1/2" Ice	2.257	0.615	0.035
			0.000			1" Ice	2.443	0.732	0.050
A2	B	From Face	0.500	0.000	150.000	No Ice	2.077	0.505	0.022
(AT&T - Proposed)			0.000			1/2" Ice	2.257	0.615	0.035
			0.000			1" Ice	2.443	0.732	0.050
A2	C	From Face	0.500	0.000	150.000	No Ice	2.077	0.505	0.022
(AT&T - Proposed)			0.000			1/2" Ice	2.257	0.615	0.035
			0.000			1" Ice	2.443	0.732	0.050
HPA-65R-BUU-H6	A	From Face	3.000	0.000	148.000	No Ice	9.658	6.450	0.051
(AT&T - Proposed)			6.000			1/2" Ice	10.128	6.913	0.114
			0.000			1" Ice	10.606	7.384	0.183
HPA-65R-BUU-H6	B	From Face	3.000	0.000	148.000	No Ice	9.658	6.450	0.051
(AT&T - Proposed)			6.000			1/2" Ice	10.128	6.913	0.114
			0.000			1" Ice	10.606	7.384	0.183
HPA-65R-BUU-H6	C	From Face	3.000	0.000	148.000	No Ice	9.658	6.450	0.051
(AT&T - Proposed)			6.000			1/2" Ice	10.128	6.913	0.114
			0.000			1" Ice	10.606	7.384	0.183
RRUS-11	A	From Face	0.500	0.000	150.000	No Ice	2.566	1.068	0.050
(AT&T - Existing)			0.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
RRUS-11	B	From Face	0.500	0.000	150.000	No Ice	2.566	1.068	0.050
(AT&T - Existing)			0.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
RRUS-11	C	From Face	0.500	0.000	150.000	No Ice	2.566	1.068	0.050
(AT&T - Existing)			0.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
DC6-48-60-18-8F Surge Arrestor	C	From Face	0.500	0.000	150.000	No Ice	1.909	1.909	0.020
			0.000			1/2" Ice	2.098	2.098	0.039
(AT&T - Existing)			0.000			1" Ice	2.294	2.294	0.062
Valmont Uni-Tri Bracket	C	None		0.000	150.000	No Ice	1.750	1.750	0.290
(AT&T - Existing)						1/2" Ice	1.940	1.940	0.306
						1" Ice	2.130	2.130	0.323
13' Platform w/Rails	C	None		0.000	136.000	No Ice	17.200	17.200	2.000
(Sprint - Existing)						1/2" Ice	22.300	22.300	3.000
						1" Ice	83.000	83.000	4.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVTM14	A	From Face	3.000	0.000	138.000	No Ice	6.342	3.607	0.056
(Sprint - Existing)			0.000			1/2" Ice	6.716	3.967	0.096
			0.000			1" Ice	7.097	4.333	0.140
APXVSPP18-C-A20	A	From Face	3.000	0.000	138.000	No Ice	8.024	5.283	0.057
(Sprint - Existing)			-6.000			1/2" Ice	8.480	5.736	0.107
			0.000			1" Ice	8.943	6.196	0.162
APXVTM14	B	From Face	3.000	0.000	138.000	No Ice	6.342	3.607	0.056
(Sprint - Existing)			0.000			1/2" Ice	6.716	3.967	0.096
			0.000			1" Ice	7.097	4.333	0.140
APXVSPP18-C-A20	B	From Face	3.000	0.000	138.000	No Ice	8.024	5.283	0.057
(Sprint - Existing)			-6.000			1/2" Ice	8.480	5.736	0.107
			0.000			1" Ice	8.943	6.196	0.162
APXVTM14	C	From Face	3.000	0.000	138.000	No Ice	6.342	3.607	0.056
(Sprint - Existing)			0.000			1/2" Ice	6.716	3.967	0.096
			0.000			1" Ice	7.097	4.333	0.140
APXVSPP18-C-A20	C	From Face	3.000	0.000	138.000	No Ice	8.024	5.283	0.057
(Sprint - Existing)			-6.000			1/2" Ice	8.480	5.736	0.107
			0.000			1" Ice	8.943	6.196	0.162
FD-RRH 2x50 800	A	From Face	1.000	0.000	138.000	No Ice	2.058	1.932	0.064
(Sprint - Existing)			0.000			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
FD-RRH 2x50 800	B	From Face	1.000	0.000	138.000	No Ice	2.058	1.932	0.064
(Sprint - Existing)			0.000			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
FD-RRH 2x50 800	C	From Face	1.000	0.000	138.000	No Ice	2.058	1.932	0.064
(Sprint - Existing)			0.000			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
FD-RRH 4x45 1900	A	From Face	1.000	0.000	138.000	No Ice	2.319	2.384	0.060
(Sprint - Existing)			0.000			1/2" Ice	2.524	2.590	0.084
			0.000			1" Ice	2.736	2.804	0.111
FD-RRH 4x45 1900	B	From Face	1.000	0.000	138.000	No Ice	2.319	2.384	0.060
(Sprint - Existing)			0.000			1/2" Ice	2.524	2.590	0.084
			0.000			1" Ice	2.736	2.804	0.111
FD-RRH 4x45 1900	C	From Face	1.000	0.000	138.000	No Ice	2.319	2.384	0.060
(Sprint - Existing)			0.000			1/2" Ice	2.524	2.590	0.084
			0.000			1" Ice	2.736	2.804	0.111
TD-RRH8x20-25	A	From Face	1.000	0.000	138.000	No Ice	4.045	1.533	0.070
(Sprint - Existing)			0.000			1/2" Ice	4.298	1.712	0.097
			0.000			1" Ice	4.557	1.899	0.128
TD-RRH8x20-25	B	From Face	1.000	0.000	138.000	No Ice	4.045	1.533	0.070
(Sprint - Existing)			0.000			1/2" Ice	4.298	1.712	0.097
			0.000			1" Ice	4.557	1.899	0.128
TD-RRH8x20-25	C	From Face	1.000	0.000	138.000	No Ice	4.045	1.533	0.070
(Sprint - Existing)			0.000			1/2" Ice	4.298	1.712	0.097
			0.000			1" Ice	4.557	1.899	0.128
AIR21 B2A/B4P	A	From Face	3.000	0.000	123.000	No Ice	6.049	4.356	0.083
(T-Mobile - Existing)			-6.000			1/2" Ice	6.419	4.705	0.125
			0.000			1" Ice	6.795	5.061	0.172
AIR32	A	From Face	3.000	0.000	123.000	No Ice	6.510	4.712	0.133
(T-Mobile - Existing)			3.000			1/2" Ice	6.887	5.068	0.179
			0.000			1" Ice	7.271	5.431	0.230
LNX-6515DS	A	From Face	3.000	0.000	123.000	No Ice	11.445	7.696	0.055
(T-Mobile - Existing)			6.000			1/2" Ice	12.064	8.289	0.121
			0.000			1" Ice	12.689	8.889	0.194
AIR21 B2A/B4P	B	From Face	3.000	0.000	123.000	No Ice	6.049	4.356	0.083
(T-Mobile - Existing)			-6.000			1/2" Ice	6.419	4.705	0.125
			0.000			1" Ice	6.795	5.061	0.172

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR32	B	From Face	3.000	0.000	123.000	No Ice	6.510	4.712	0.133
(T-Mobile - Existing)			3.000			1/2" Ice	6.887	5.068	0.179
			0.000			1" Ice	7.271	5.431	0.230
LNX-6515DS	B	From Face	3.000	0.000	123.000	No Ice	11.445	7.696	0.055
(T-Mobile - Existing)			6.000			1/2" Ice	12.064	8.289	0.121
			0.000			1" Ice	12.689	8.889	0.194
AIR21 B2A/B4P	C	From Face	3.000	0.000	123.000	No Ice	6.049	4.356	0.083
(T-Mobile - Existing)			-6.000			1/2" Ice	6.419	4.705	0.125
			0.000			1" Ice	6.795	5.061	0.172
AIR32	C	From Face	3.000	0.000	123.000	No Ice	6.510	4.712	0.133
(T-Mobile - Existing)			3.000			1/2" Ice	6.887	5.068	0.179
			0.000			1" Ice	7.271	5.431	0.230
LNX-6515DS	C	From Face	3.000	0.000	123.000	No Ice	11.445	7.696	0.055
(T-Mobile - Existing)			6.000			1/2" Ice	12.064	8.289	0.121
			0.000			1" Ice	12.689	8.889	0.194
TMA 10"x8"x3"	A	From Face	3.000	0.000	123.000	No Ice	0.667	0.258	0.015
(T-Mobile - Existing)			0.000			1/2" Ice	0.770	0.331	0.020
			0.000			1" Ice	0.881	0.411	0.027
TMA 10"x8"x3"	B	From Face	3.000	0.000	123.000	No Ice	0.667	0.258	0.015
(T-Mobile - Existing)			0.000			1/2" Ice	0.770	0.331	0.020
			0.000			1" Ice	0.881	0.411	0.027
TMA 10"x8"x3"	C	From Face	3.000	0.000	123.000	No Ice	0.667	0.258	0.015
(T-Mobile - Existing)			0.000			1/2" Ice	0.770	0.331	0.020
			0.000			1" Ice	0.881	0.411	0.027
RRUS-11	A	From Face	3.000	0.000	123.000	No Ice	2.566	1.068	0.050
(T-Mobile - Existing)			-6.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
RRUS-11	B	From Face	3.000	0.000	123.000	No Ice	2.566	1.068	0.050
(T-Mobile - Existing)			-6.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
RRUS-11	C	From Face	3.000	0.000	123.000	No Ice	2.566	1.068	0.050
(T-Mobile - Existing)			-6.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
13' Platform w/Rails	C	None		0.000	121.000	No Ice	17.200	17.200	2.000
(T-Mobile - Existing)						1/2" Ice	22.300	22.300	3.000
						1" Ice	83.000	83.000	4.000
Stand-off	C	From Face	1.000	0.000	75.000	No Ice	0.750	0.750	0.027
			0.000			1/2" Ice	0.950	0.950	0.036
			0.000			1" Ice	5.060	5.060	0.138
Stand-off	A	From Face	1.000	0.000	75.000	No Ice	0.750	0.750	0.027
			0.000			1/2" Ice	0.950	0.950	0.036
			0.000			1" Ice	5.060	5.060	0.138
GPS	A	From Face	2.000	0.000	76.000	No Ice	1.000	1.000	0.010
(Sprint - Existing)			0.000			1/2" Ice	1.500	1.500	0.015
			0.000			1" Ice	2.000	2.000	0.020

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2-11-DW1 (Clearwire - Existing)	A	Paraboloid w/Radome	From Face	3.000 -2.000 0.000	Worst		164.000	2.000	No Ice 1/2" Ice 1" Ice	3.142 3.409 3.676	0.035 0.017 0.000
VHLP2-11-DW1 (Clearwire - Existing)	C	Paraboloid w/Radome	From Face	3.000 -2.000 0.000	Worst		164.000	2.000	No Ice 1/2" Ice 1" Ice	3.142 3.409 3.676	0.035 0.017 0.000

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 160.000-123.3	140.598	1.36	0.031	83.298	A	0.000	83.298	83.298	100.00	0.000	0.000
					B	0.000	83.298		100.00	0.000	0.000
30					C	0.000	83.298		100.00	0.000	0.000
L2 123.330-86.17	104.033	1.276	0.029	116.157	A	0.000	116.157	116.157	100.00	0.000	0.000
					B	0.000	116.157		100.00	0.000	7.292
0					C	0.000	116.157		100.00	0.000	0.000
L3 86.170-37.170	61.012	1.141	0.026	201.243	A	0.000	201.243	201.243	100.00	0.000	0.000
					B	0.000	201.243		100.00	0.000	9.702
					C	0.000	201.243		100.00	0.000	0.000
L4 37.170-0.000	18.631	0.889	0.021	188.536	A	0.000	188.536	188.536	100.00	0.000	0.000
					B	0.000	188.536		100.00	0.000	6.766
					C	0.000	188.536		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 160.000-123.330	140.598	1.36	0.008	1.734	93.896	A	0.000	93.896	93.896	100.00	0.000	0.000
						B	0.000	93.896		100.00	0.000	0.000
						C	0.000	93.896		100.00	0.000	0.000
L2 123.330-86.170	104.033	1.276	0.008	1.683	126.896	A	0.000	126.896	126.896	100.00	0.000	0.000
						B	0.000	126.896		100.00	0.000	20.065
						C	0.000	126.896		100.00	0.000	0.000
L3 86.170-37.170	61.012	1.141	0.007	1.595	214.983	A	0.000	214.983	214.983	100.00	0.000	0.000
						B	0.000	214.983		100.00	0.000	26.191
						C	0.000	214.983		100.00	0.000	0.000
L4 37.170-0.000	18.631	0.889	0.006	1.417	198.418	A	0.000	198.418	198.418	100.00	0.000	0.000
						B	0.000	198.418		100.00	0.000	17.666
						C	0.000	198.418		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	140.598	1.36	0.011	83.298	A	0.000	83.298	83.298	100.00	0.000	0.000
160.000-123.3					B	0.000	83.298		100.00	0.000	0.000
30					C	0.000	83.298		100.00	0.000	0.000
L2	104.033	1.276	0.010	116.157	A	0.000	116.157	116.157	100.00	0.000	0.000
123.330-86.17					B	0.000	116.157		100.00	0.000	7.292
0					C	0.000	116.157		100.00	0.000	0.000
L3	61.012	1.141	0.009	201.243	A	0.000	201.243	201.243	100.00	0.000	0.000
86.170-37.170					B	0.000	201.243		100.00	0.000	9.702
					C	0.000	201.243		100.00	0.000	0.000
L4	18.631	0.889	0.007	188.536	A	0.000	188.536	188.536	100.00	0.000	0.000
37.170-0.000					B	0.000	188.536		100.00	0.000	6.766
					C	0.000	188.536		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.031	1	1	83.298	2.849	0.078	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.029	1	1	116.157	3.962	0.107	C
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			
L3	3.210	12.197	A	1	1	0.026	1	1	201.243	6.025	0.123	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.021	1	1	188.536	4.451	0.120	C
37.170-0.000			B	1	1		1	1	188.536			
			C	1	1		1	1	188.536			
Sum Weight:	9.210	33.152						OTM	1263.285 kip-ft	17.287		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.031	1	1	83.298	2.849	0.078	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.029	1	1	116.157	3.962	0.107	C
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L3	3.210	12.197	A	1	1	0.026	1	1	201.243	6.025	0.123	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.021	1	1	188.536	4.451	0.120	C
37.170-0.000			B	1	1		1	1	188.536			
			C	1	1		1	1	188.536			
Sum Weight:	9.210	33.152						OTM	1263.285 kip-ft	17.287		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.031	1	1	83.298	2.849	0.078	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.029	1	1	116.157	3.962	0.107	C
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			
L3	3.210	12.197	A	1	1	0.026	1	1	201.243	6.025	0.123	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.021	1	1	188.536	4.451	0.120	C
37.170-0.000			B	1	1		1	1	188.536			
			C	1	1		1	1	188.536			
Sum Weight:	9.210	33.152						OTM	1263.285 kip-ft	17.287		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.031	1	1	83.298	2.849	0.078	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.029	1	1	116.157	3.962	0.107	C
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			
L3	3.210	12.197	A	1	1	0.026	1	1	201.243	6.025	0.123	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.021	1	1	188.536	4.451	0.120	C
37.170-0.000			B	1	1		1	1	188.536			
			C	1	1		1	1	188.536			
Sum Weight:	9.210	33.152						OTM	1263.285	17.287		

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
									kip-ft			

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.340	4.532	A	1	1.2	0.008	1	1	93.896	1.024	0.028	C
160.000-123.3			B	1	1.2		1	1	93.896			
30			C	1	1.2		1	1	93.896			
L2	4.211	8.524	A	1	1.2	0.008	1	1	126.896	1.469	0.040	C
123.330-86.17			B	1	1.2		1	1	126.896			
0			C	1	1.2		1	1	126.896			
L3	5.501	17.012	A	1	1.2	0.007	1	1	214.983	2.157	0.044	C
86.170-37.170			B	1	1.2		1	1	214.983			
			C	1	1.2		1	1	214.983			
L4	3.729	17.073	A	1	1.2	0.006	1	1	198.418	1.549	0.042	C
37.170-0.000			B	1	1.2		1	1	198.418			
			C	1	1.2		1	1	198.418			
Sum Weight:	14.781	47.140						OTM	457.294 kip-ft	6.199		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.340	4.532	A	1	1.2	0.008	1	1	93.896	1.024	0.028	C
160.000-123.3			B	1	1.2		1	1	93.896			
30			C	1	1.2		1	1	93.896			
L2	4.211	8.524	A	1	1.2	0.008	1	1	126.896	1.469	0.040	C
123.330-86.17			B	1	1.2		1	1	126.896			
0			C	1	1.2		1	1	126.896			
L3	5.501	17.012	A	1	1.2	0.007	1	1	214.983	2.157	0.044	C
86.170-37.170			B	1	1.2		1	1	214.983			
			C	1	1.2		1	1	214.983			
L4	3.729	17.073	A	1	1.2	0.006	1	1	198.418	1.549	0.042	C
37.170-0.000			B	1	1.2		1	1	198.418			
			C	1	1.2		1	1	198.418			
Sum Weight:	14.781	47.140						OTM	457.294 kip-ft	6.199		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.340	4.532	A	1	1.2	0.008	1	1	93.896	1.024	0.028	C
160.000-123.3			B	1	1.2		1	1	93.896			
30			C	1	1.2		1	1	93.896			
L2	4.211	8.524	A	1	1.2	0.008	1	1	126.896	1.469	0.040	C
123.330-86.17			B	1	1.2		1	1	126.896			
0			C	1	1.2		1	1	126.896			
L3	5.501	17.012	A	1	1.2	0.007	1	1	214.983	2.157	0.044	C
86.170-37.170			B	1	1.2		1	1	214.983			
			C	1	1.2		1	1	214.983			
L4	3.729	17.073	A	1	1.2	0.006	1	1	198.418	1.549	0.042	C
37.170-0.000			B	1	1.2		1	1	198.418			
			C	1	1.2		1	1	198.418			
Sum Weight:	14.781	47.140						OTM	457.294 kip-ft	6.199		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.340	4.532	A	1	1.2	0.008	1	1	93.896	1.024	0.028	C
160.000-123.3			B	1	1.2		1	1	93.896			
30			C	1	1.2		1	1	93.896			
L2	4.211	8.524	A	1	1.2	0.008	1	1	126.896	1.469	0.040	C
123.330-86.17			B	1	1.2		1	1	126.896			
0			C	1	1.2		1	1	126.896			
L3	5.501	17.012	A	1	1.2	0.007	1	1	214.983	2.157	0.044	C
86.170-37.170			B	1	1.2		1	1	214.983			
			C	1	1.2		1	1	214.983			
L4	3.729	17.073	A	1	1.2	0.006	1	1	198.418	1.549	0.042	C
37.170-0.000			B	1	1.2		1	1	198.418			
			C	1	1.2		1	1	198.418			
Sum Weight:	14.781	47.140						OTM	457.294 kip-ft	6.199		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.011	1	1	83.298	0.975	0.027	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.010	1	1	116.157	1.356	0.036	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			
L3	3.210	12.197	A	1	1	0.009	1	1	201.243	2.063	0.042	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.007	1	1	188.536	1.524	0.041	C
37.170-0.000			B	1	1		1	1	188.536			
			C	1	1		1	1	188.536			
Sum Weight:	9.210	33.152						OTM	432.470 kip-ft	5.918		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.011	1	1	83.298	0.975	0.027	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.010	1	1	116.157	1.356	0.036	C
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			
L3	3.210	12.197	A	1	1	0.009	1	1	201.243	2.063	0.042	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.007	1	1	188.536	1.524	0.041	C
37.170-0.000			B	1	1		1	1	188.536			
			C	1	1		1	1	188.536			
Sum Weight:	9.210	33.152						OTM	432.470 kip-ft	5.918		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.011	1	1	83.298	0.975	0.027	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.010	1	1	116.157	1.356	0.036	C
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			
L3	3.210	12.197	A	1	1	0.009	1	1	201.243	2.063	0.042	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.007	1	1	188.536	1.524	0.041	C
37.170-0.000			B	1	1		1	1	188.536			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
Sum Weight:	9.210	33.152	C	1	1		1	1 OTM	188.536 432.470 kip-ft	5.918		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.340	2.298	A	1	1	0.011	1	1	83.298	0.975	0.027	C
160.000-123.3			B	1	1		1	1	83.298			
30			C	1	1		1	1	83.298			
L2	2.420	5.555	A	1	1	0.010	1	1	116.157	1.356	0.036	C
123.330-86.17			B	1	1		1	1	116.157			
0			C	1	1		1	1	116.157			
L3	3.210	12.197	A	1	1	0.009	1	1	201.243	2.063	0.042	C
86.170-37.170			B	1	1		1	1	201.243			
			C	1	1		1	1	201.243			
L4	2.240	13.103	A	1	1	0.007	1	1	188.536	1.524	0.041	C
37.170-0.000			B	1	1		1	1	188.536			
			C	1	1		1	1	188.536			
Sum Weight:	9.210	33.152						OTM	432.470 kip-ft	5.918		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	33.152					
Bracing Weight	0.000					
Total Member Self-Weight	33.152			0.143	0.364	
Total Weight	54.934			0.143	0.364	
Wind 0 deg - No Ice		-0.047	-32.526	-3501.751	8.263	-0.075
Wind 30 deg - No Ice		16.200	-28.145	-3028.636	-1740.544	0.179
Wind 45 deg - No Ice		22.935	-22.966	-2470.484	-2465.740	0.292
Wind 60 deg - No Ice		28.107	-16.222	-1743.963	-3022.875	0.385
Wind 90 deg - No Ice		32.483	0.047	8.042	-3495.133	0.488
Wind 120 deg - No Ice		28.154	16.304	1757.931	-3030.774	0.460
Wind 135 deg - No Ice		23.002	23.033	2481.941	-2476.911	0.398
Wind 150 deg - No Ice		16.282	28.192	3036.821	-1754.225	0.309
Wind 180 deg - No Ice		0.047	32.526	3502.036	-7.535	0.075
Wind 210 deg - No Ice		-16.200	28.145	3028.922	1741.271	-0.179
Wind 225 deg - No Ice		-22.935	22.966	2470.770	2466.468	-0.292
Wind 240 deg - No Ice		-28.107	16.222	1744.249	3023.603	-0.385
Wind 270 deg - No Ice		-32.483	-0.047	-7.756	3495.860	-0.488
Wind 300 deg - No Ice		-28.154	-16.304	-1757.645	3031.502	-0.460

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 315 deg - No Ice		-23.002	-23.033	-2481.655	2477.639	-0.398
Wind 330 deg - No Ice		-16.282	-28.192	-3036.535	1754.953	-0.309
Member Ice	13.988					
Total Weight Ice	100.948			0.605	0.567	
Wind 0 deg - Ice		-0.015	-14.720	-1685.267	3.056	-0.247
Wind 30 deg - Ice		7.341	-12.740	-1458.159	-839.388	-0.123
Wind 45 deg - Ice		10.390	-10.398	-1189.727	-1188.597	-0.046
Wind 60 deg - Ice		12.730	-7.347	-840.176	-1456.767	0.034
Wind 90 deg - Ice		14.708	0.015	3.094	-1683.654	0.182
Wind 120 deg - Ice		12.745	7.373	845.697	-1459.255	0.281
Wind 135 deg - Ice		10.411	10.419	1194.457	-1192.117	0.303
Wind 150 deg - Ice		7.367	12.755	1461.858	-843.699	0.305
Wind 180 deg - Ice		0.015	14.720	1686.478	-1.922	0.247
Wind 210 deg - Ice		-7.341	12.740	1459.369	840.522	0.123
Wind 225 deg - Ice		-10.390	10.398	1190.938	1189.731	0.046
Wind 240 deg - Ice		-12.730	7.347	841.386	1457.901	-0.034
Wind 270 deg - Ice		-14.708	-0.015	-1.883	1684.788	-0.182
Wind 300 deg - Ice		-12.745	-7.373	-844.486	1460.389	-0.281
Wind 315 deg - Ice		-10.411	-10.419	-1193.246	1193.251	-0.303
Wind 330 deg - Ice		-7.367	-12.755	-1460.647	844.833	-0.305
Total Weight	54.934			0.143	0.364	
Wind 0 deg - Service		-0.016	-11.135	-1198.686	3.068	-0.026
Wind 30 deg - Service		5.546	-9.635	-1036.721	-595.614	0.061
Wind 45 deg - Service		7.852	-7.862	-845.645	-843.876	0.100
Wind 60 deg - Service		9.622	-5.553	-596.930	-1034.604	0.132
Wind 90 deg - Service		11.120	0.016	2.847	-1196.275	0.167
Wind 120 deg - Service		9.638	5.581	601.899	-1037.308	0.158
Wind 135 deg - Service		7.874	7.885	849.755	-847.700	0.136
Wind 150 deg - Service		5.574	9.651	1039.711	-600.298	0.106
Wind 180 deg - Service		0.016	11.135	1198.972	-2.340	0.026
Wind 210 deg - Service		-5.546	9.635	1037.007	596.342	-0.061
Wind 225 deg - Service		-7.852	7.862	845.931	844.603	-0.100
Wind 240 deg - Service		-9.622	5.553	597.216	1035.332	-0.132
Wind 270 deg - Service		-11.120	-0.016	-2.561	1197.003	-0.167
Wind 300 deg - Service		-9.638	-5.581	-601.614	1038.036	-0.158
Wind 315 deg - Service		-7.874	-7.885	-849.469	848.428	-0.136
Wind 330 deg - Service		-5.574	-9.651	-1039.426	601.025	-0.106

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice

Comb. No.	Description
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 123.33	Pole	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	34	-37.693	0.121	-0.443
			Max. Mx	26	-12.884	575.681	2.939
			Max. My	18	-12.873	-2.707	-576.851
			Max. Vy	26	-24.862	575.681	2.939
			Max. Vx	18	24.933	-2.707	-576.851
			Max. Torque	2			1.052
L2	123.33 - 86.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-60.204	0.121	-0.443
			Max. Mx	26	-25.291	1722.438	5.807
			Max. My	18	-25.282	-5.595	-1726.223
			Max. Vy	26	-35.617	1722.438	5.807
			Max. Vx	18	35.690	-5.595	-1726.223
			Max. Torque	11			-0.859
L3	86.17 - 37.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-85.134	0.640	-0.634
			Max. Mx	26	-43.521	3625.774	9.548
			Max. My	18	-43.517	-9.258	-3632.907
			Max. Vy	26	-44.490	3625.774	9.548
			Max. Vx	18	44.562	-9.258	-3632.907
			Max. Torque	11			-0.856
L4	37.17 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-113.664	0.640	-0.634
			Max. Mx	26	-65.891	5780.170	12.991
			Max. My	18	-65.891	-12.699	-5790.464
			Max. Vy	26	-52.010	5780.170	12.991
			Max. Vx	18	52.080	-12.699	-5790.464
			Max. Torque	11			-0.814

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	43	113.664	-0.015	-14.720
	Max. H_x	26	65.921	51.972	0.076
	Max. H_z	2	65.921	0.076	52.042
	Max. M_x	2	5790.102	0.076	52.042
	Max. M_z	10	5779.243	-51.972	-0.076
	Max. Torsion	28	0.758	45.047	26.086
	Min. Vert	15	49.441	-36.803	-36.853
	Min. H_x	10	65.921	-51.972	-0.076
	Min. H_z	18	65.921	-0.076	-52.042
	Min. M_x	18	-5790.464	-0.076	-52.042
	Min. M_z	26	-5780.170	51.972	0.076
	Min. Torsion	11	-0.813	-51.972	-0.076

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	54.934	0.000	0.000	0.143	0.364	0.000
1.2 Dead+1.6 Wind 0 deg - No	65.921	-0.076	-52.042	-5790.102	13.633	-0.227

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
0.9 Dead+1.6 Wind 0 deg - No Ice	49.441	-0.076	-52.042	-5739.818	13.368	-0.211
1.2 Dead+1.6 Wind 30 deg - No Ice	65.921	25.920	-45.032	-5007.831	-2877.998	0.237
0.9 Dead+1.6 Wind 30 deg - No Ice	49.441	25.920	-45.032	-4964.351	-2853.125	0.250
1.2 Dead+1.6 Wind 45 deg - No Ice	65.921	36.696	-36.746	-4084.923	-4077.125	0.453
0.9 Dead+1.6 Wind 45 deg - No Ice	49.441	36.696	-36.746	-4049.472	-4041.824	0.464
1.2 Dead+1.6 Wind 60 deg - No Ice	65.921	44.971	-25.955	-2883.609	-4998.366	0.630
0.9 Dead+1.6 Wind 60 deg - No Ice	49.441	44.971	-25.955	-2858.606	-4955.050	0.638
1.2 Dead+1.6 Wind 90 deg - No Ice	65.921	51.972	0.076	13.341	-5779.243	0.812
0.9 Dead+1.6 Wind 90 deg - No Ice	49.441	51.972	0.076	13.152	-5729.134	0.813
1.2 Dead+1.6 Wind 120 deg - No Ice	65.921	45.047	26.086	2906.718	-5011.454	0.740
0.9 Dead+1.6 Wind 120 deg - No Ice	49.441	45.047	26.086	2881.377	-4967.998	0.734
1.2 Dead+1.6 Wind 135 deg - No Ice	65.921	36.803	36.853	4103.821	-4095.673	0.626
0.9 Dead+1.6 Wind 135 deg - No Ice	49.441	36.803	36.853	4068.077	-4060.171	0.617
1.2 Dead+1.6 Wind 150 deg - No Ice	65.921	26.052	45.107	5021.273	-2900.760	0.476
0.9 Dead+1.6 Wind 150 deg - No Ice	49.441	26.052	45.107	4977.560	-2875.640	0.465
1.2 Dead+1.6 Wind 180 deg - No Ice	65.921	0.076	52.042	5790.464	-12.699	0.127
0.9 Dead+1.6 Wind 180 deg - No Ice	49.441	0.076	52.042	5740.085	-12.679	0.113
1.2 Dead+1.6 Wind 210 deg - No Ice	65.921	-25.920	45.032	5008.188	2878.936	-0.220
0.9 Dead+1.6 Wind 210 deg - No Ice	49.441	-25.920	45.032	4964.614	2853.816	-0.233
1.2 Dead+1.6 Wind 225 deg - No Ice	65.921	-36.696	36.746	4085.276	4078.062	-0.376
0.9 Dead+1.6 Wind 225 deg - No Ice	49.441	-36.696	36.746	4049.732	4042.515	-0.388
1.2 Dead+1.6 Wind 240 deg - No Ice	65.921	-44.971	25.955	2883.959	4999.300	-0.514
0.9 Dead+1.6 Wind 240 deg - No Ice	49.441	-44.971	25.955	2858.864	4955.739	-0.524
1.2 Dead+1.6 Wind 270 deg - No Ice	65.921	-51.972	-0.076	-12.991	5780.170	-0.714
0.9 Dead+1.6 Wind 270 deg - No Ice	49.441	-51.972	-0.076	-12.894	5729.818	-0.716
1.2 Dead+1.6 Wind 300 deg - No Ice	65.921	-45.047	-26.086	-2906.362	5012.378	-0.758
0.9 Dead+1.6 Wind 300 deg - No Ice	49.441	-45.047	-26.086	-2881.115	4968.680	-0.752
1.2 Dead+1.6 Wind 315 deg - No Ice	65.921	-36.803	-36.853	-4103.462	4096.597	-0.703
0.9 Dead+1.6 Wind 315 deg - No Ice	49.441	-36.803	-36.853	-4067.813	4060.853	-0.694
1.2 Dead+1.6 Wind 330 deg - No Ice	65.921	-26.052	-45.107	-5020.912	2901.686	-0.593

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 330 deg - No Ice	49.441	-26.052	-45.107	-4977.293	2876.323	-0.581
1.2 Dead+1.0 Ice+1.0 Temp	113.664	0.000	0.000	0.634	0.640	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	113.664	-0.015	-14.720	-1825.216	3.458	-0.282
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	113.664	7.341	-12.741	-1579.212	-908.986	-0.156
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	113.664	10.390	-10.398	-1288.465	-1287.217	-0.074
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	113.664	12.731	-7.347	-909.861	-1577.678	0.012
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	113.664	14.709	0.015	3.483	-1823.441	0.173
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	113.664	12.746	7.373	916.091	-1580.424	0.286
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	113.664	10.411	10.419	1293.821	-1291.102	0.315
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	113.664	7.367	12.755	1583.429	-913.745	0.323
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	113.664	0.015	14.720	1826.688	-2.038	0.276
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	113.664	-7.341	12.741	1580.684	910.407	0.157
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	113.664	-10.390	10.398	1289.937	1288.639	0.079
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	113.664	-12.731	7.347	911.333	1579.100	-0.004
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	113.664	-14.709	-0.015	-2.013	1824.863	-0.167
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	113.664	-12.746	-7.373	-914.621	1581.846	-0.287
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	113.664	-10.411	-10.419	-1292.351	1292.523	-0.320
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	113.664	-7.367	-12.755	-1581.959	915.166	-0.330
Dead+Wind 0 deg - Service	54.934	-0.016	-11.135	-1233.299	3.186	-0.038
Dead+Wind 30 deg - Service	54.934	5.546	-9.635	-1066.647	-612.784	0.052
Dead+Wind 45 deg - Service	54.934	7.852	-7.862	-870.049	-868.217	0.094
Dead+Wind 60 deg - Service	54.934	9.622	-5.553	-614.147	-1064.456	0.129
Dead+Wind 90 deg - Service	54.934	11.120	0.016	2.953	-1230.805	0.168
Dead+Wind 120 deg - Service	54.934	9.638	5.581	619.303	-1067.258	0.161
Dead+Wind 135 deg - Service	54.934	7.874	7.885	874.313	-872.179	0.141
Dead+Wind 150 deg - Service	54.934	5.574	9.651	1069.751	-617.637	0.111
Dead+Wind 180 deg - Service	54.934	0.016	11.135	1233.601	-2.418	0.034
Dead+Wind 210 deg - Service	54.934	-5.546	9.635	1066.950	613.552	-0.052
Dead+Wind 225 deg - Service	54.934	-7.852	7.862	870.351	868.985	-0.090
Dead+Wind 240 deg - Service	54.934	-9.622	5.553	614.450	1065.225	-0.123
Dead+Wind 270 deg - Service	54.934	-11.120	-0.016	-2.651	1231.573	-0.164
Dead+Wind 300 deg - Service	54.934	-9.638	-5.581	-619.000	1068.026	-0.162
Dead+Wind 315 deg - Service	54.934	-7.874	-7.885	-874.011	872.947	-0.144
Dead+Wind 330 deg - Service	54.934	-5.574	-9.651	-1069.448	618.405	-0.117

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-54.934	0.000	0.000	54.934	0.000	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
2	-0.076	-65.921	-52.042	0.076	65.921	52.042	0.000%
3	-0.076	-49.441	-52.042	0.076	49.441	52.042	0.000%
4	25.920	-65.921	-45.032	-25.920	65.921	45.032	0.000%
5	25.920	-49.441	-45.032	-25.920	49.441	45.032	0.000%
6	36.696	-65.921	-36.746	-36.696	65.921	36.746	0.000%
7	36.696	-49.441	-36.746	-36.696	49.441	36.746	0.000%
8	44.971	-65.921	-25.955	-44.971	65.921	25.955	0.000%
9	44.971	-49.441	-25.955	-44.971	49.441	25.955	0.000%
10	51.972	-65.921	0.076	-51.972	65.921	-0.076	0.000%
11	51.972	-49.441	0.076	-51.972	49.441	-0.076	0.000%
12	45.047	-65.921	26.086	-45.047	65.921	-26.086	0.000%
13	45.047	-49.441	26.086	-45.047	49.441	-26.086	0.000%
14	36.803	-65.921	36.853	-36.803	65.921	-36.853	0.000%
15	36.803	-49.441	36.853	-36.803	49.441	-36.853	0.000%
16	26.052	-65.921	45.107	-26.052	65.921	-45.107	0.000%
17	26.052	-49.441	45.107	-26.052	49.441	-45.107	0.000%
18	0.076	-65.921	52.042	-0.076	65.921	-52.042	0.000%
19	0.076	-49.441	52.042	-0.076	49.441	-52.042	0.000%
20	-25.920	-65.921	45.032	25.920	65.921	-45.032	0.000%
21	-25.920	-49.441	45.032	25.920	49.441	-45.032	0.000%
22	-36.696	-65.921	36.746	36.696	65.921	-36.746	0.000%
23	-36.696	-49.441	36.746	36.696	49.441	-36.746	0.000%
24	-44.971	-65.921	25.955	44.971	65.921	-25.955	0.000%
25	-44.971	-49.441	25.955	44.971	49.441	-25.955	0.000%
26	-51.972	-65.921	-0.076	51.972	65.921	0.076	0.000%
27	-51.972	-49.441	-0.076	51.972	49.441	0.076	0.000%
28	-45.047	-65.921	-26.086	45.047	65.921	26.086	0.000%
29	-45.047	-49.441	-26.086	45.047	49.441	26.086	0.000%
30	-36.803	-65.921	-36.853	36.803	65.921	36.853	0.000%
31	-36.803	-49.441	-36.853	36.803	49.441	36.853	0.000%
32	-26.052	-65.921	-45.107	26.052	65.921	45.107	0.000%
33	-26.052	-49.441	-45.107	26.052	49.441	45.107	0.000%
34	0.000	-113.664	0.000	0.000	113.664	0.000	0.000%
35	-0.015	-113.664	-14.720	0.015	113.664	14.720	0.000%
36	7.341	-113.664	-12.740	-7.341	113.664	12.741	0.000%
37	10.390	-113.664	-10.398	-10.390	113.664	10.398	0.000%
38	12.730	-113.664	-7.347	-12.731	113.664	7.347	0.000%
39	14.708	-113.664	0.015	-14.709	113.664	-0.015	0.000%
40	12.745	-113.664	7.373	-12.746	113.664	-7.373	0.000%
41	10.411	-113.664	10.419	-10.411	113.664	-10.419	0.000%
42	7.367	-113.664	12.755	-7.367	113.664	-12.755	0.000%
43	0.015	-113.664	14.720	-0.015	113.664	-14.720	0.000%
44	-7.341	-113.664	12.740	7.341	113.664	-12.741	0.000%
45	-10.390	-113.664	10.398	10.390	113.664	-10.398	0.000%
46	-12.730	-113.664	7.347	12.731	113.664	-7.347	0.000%
47	-14.708	-113.664	-0.015	14.709	113.664	0.015	0.000%
48	-12.745	-113.664	-7.373	12.746	113.664	7.373	0.000%
49	-10.411	-113.664	-10.419	10.411	113.664	10.419	0.000%
50	-7.367	-113.664	-12.755	7.367	113.664	12.755	0.000%
51	-0.016	-54.934	-11.135	0.016	54.934	11.135	0.000%
52	5.546	-54.934	-9.635	-5.546	54.934	9.635	0.000%
53	7.852	-54.934	-7.862	-7.852	54.934	7.862	0.000%
54	9.622	-54.934	-5.553	-9.622	54.934	5.553	0.000%
55	11.120	-54.934	0.016	-11.120	54.934	-0.016	0.000%
56	9.638	-54.934	5.581	-9.638	54.934	-5.581	0.000%
57	7.874	-54.934	7.885	-7.874	54.934	-7.885	0.000%
58	5.574	-54.934	9.651	-5.574	54.934	-9.651	0.000%
59	0.016	-54.934	11.135	-0.016	54.934	-11.135	0.000%
60	-5.546	-54.934	9.635	5.546	54.934	-9.635	0.000%
61	-7.852	-54.934	7.862	7.852	54.934	-7.862	0.000%
62	-9.622	-54.934	5.553	9.622	54.934	-5.553	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
63	-11.120	-54.934	-0.016	11.120	54.934	0.016	0.000%
64	-9.638	-54.934	-5.581	9.638	54.934	5.581	0.000%
65	-7.874	-54.934	-7.885	7.874	54.934	7.885	0.000%
66	-5.574	-54.934	-9.651	5.574	54.934	9.651	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00022013
3	Yes	4	0.00000001	0.00010641
4	Yes	5	0.00000001	0.00066910
5	Yes	5	0.00000001	0.00027549
6	Yes	5	0.00000001	0.00072979
7	Yes	5	0.00000001	0.00029304
8	Yes	5	0.00000001	0.00065993
9	Yes	5	0.00000001	0.00027118
10	Yes	4	0.00000001	0.00044728
11	Yes	4	0.00000001	0.00026153
12	Yes	5	0.00000001	0.00067883
13	Yes	5	0.00000001	0.00027881
14	Yes	5	0.00000001	0.00073704
15	Yes	5	0.00000001	0.00029497
16	Yes	5	0.00000001	0.00067083
17	Yes	5	0.00000001	0.00027504
18	Yes	4	0.00000001	0.00020649
19	Yes	4	0.00000001	0.00010264
20	Yes	5	0.00000001	0.00066352
21	Yes	5	0.00000001	0.00027265
22	Yes	5	0.00000001	0.00073035
23	Yes	5	0.00000001	0.00029317
24	Yes	5	0.00000001	0.00067138
25	Yes	5	0.00000001	0.00027650
26	Yes	4	0.00000001	0.00021798
27	Yes	4	0.00000001	0.00011095
28	Yes	5	0.00000001	0.00066833
29	Yes	5	0.00000001	0.00027386
30	Yes	5	0.00000001	0.00073751
31	Yes	5	0.00000001	0.00029513
32	Yes	5	0.00000001	0.00067767
33	Yes	5	0.00000001	0.00027811
34	Yes	4	0.00000001	0.00000001
35	Yes	5	0.00000001	0.00042238
36	Yes	5	0.00000001	0.00065724
37	Yes	5	0.00000001	0.00071941
38	Yes	5	0.00000001	0.00065697
39	Yes	5	0.00000001	0.00042207
40	Yes	5	0.00000001	0.00066626
41	Yes	5	0.00000001	0.00072636
42	Yes	5	0.00000001	0.00066194
43	Yes	5	0.00000001	0.00042302
44	Yes	5	0.00000001	0.00066080
45	Yes	5	0.00000001	0.00072204
46	Yes	5	0.00000001	0.00066059
47	Yes	5	0.00000001	0.00042247

48	Yes	5	0.00000001	0.00066115
49	Yes	5	0.00000001	0.00072576
50	Yes	5	0.00000001	0.00066596
51	Yes	4	0.00000001	0.00003249
52	Yes	4	0.00000001	0.00026056
53	Yes	4	0.00000001	0.00029575
54	Yes	4	0.00000001	0.00025016
55	Yes	4	0.00000001	0.00003737
56	Yes	4	0.00000001	0.00026831
57	Yes	4	0.00000001	0.00030121
58	Yes	4	0.00000001	0.00025808
59	Yes	4	0.00000001	0.00003247
60	Yes	4	0.00000001	0.00025418
61	Yes	4	0.00000001	0.00029697
62	Yes	4	0.00000001	0.00026431
63	Yes	4	0.00000001	0.00003581
64	Yes	4	0.00000001	0.00025570
65	Yes	4	0.00000001	0.00030179
66	Yes	4	0.00000001	0.00026624

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.33	22.823	65	1.415	0.002
L2	128 - 86.17	14.050	66	1.133	0.001
L3	92 - 37.17	6.874	66	0.741	0.000
L4	44.5 - 0	1.549	66	0.317	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.000	GPS	65	22.823	1.415	0.002	27637
167.000	DB844H90E-M	65	22.823	1.415	0.002	27637
165.000	(4) 8'x2 1/2" Pipe Mount	65	22.823	1.415	0.002	27637
164.000	VHLP2-11-DW1	65	22.823	1.415	0.002	27637
158.000	LPA-80060-6CF	65	22.245	1.399	0.002	27637
156.000	13' Platform w/Rails	65	21.668	1.383	0.002	27637
150.000	RRUS-12	65	19.947	1.333	0.001	13818
148.000	7770.00	65	19.380	1.316	0.001	11515
146.000	13' Platform w/Rails	65	18.817	1.299	0.001	9870
138.000	APXVTM14	65	16.619	1.228	0.001	6280
136.000	13' Platform w/Rails	65	16.087	1.210	0.001	5757
123.000	AIR21 B2A/B4P	66	12.862	1.081	0.001	4501
121.000	13' Platform w/Rails	66	12.406	1.060	0.000	4579
76.000	GPS	66	4.580	0.582	0.000	6062
75.000	Stand-off	66	4.453	0.573	0.000	6059

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.33	106.989	32	6.642	0.008
L2	128 - 86.17	65.935	32	5.322	0.003
L3	92 - 37.17	32.277	32	3.480	0.001
L4	44.5 - 0	7.274	32	1.491	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.000	GPS	32	106.989	6.642	0.009	6058
167.000	DB844H90E-M	32	106.989	6.642	0.009	6058
165.000	(4) 8'x2 1/2" Pipe Mount	32	106.989	6.642	0.009	6058
164.000	VHLP2-11-DW1	32	106.989	6.642	0.009	6058
158.000	LPA-80060-6CF	32	104.286	6.565	0.008	6058
156.000	13' Platform w/Rails	32	101.586	6.488	0.008	6058
150.000	RRUS-12	32	93.538	6.256	0.007	3028
148.000	7770.00	32	90.883	6.177	0.006	2523
146.000	13' Platform w/Rails	32	88.248	6.097	0.006	2162
138.000	APXVTM14	32	77.965	5.768	0.004	1373
136.000	13' Platform w/Rails	32	75.475	5.683	0.004	1258
123.000	AIR21 B2A/B4P	32	60.368	5.081	0.002	979
121.000	13' Platform w/Rails	32	58.229	4.981	0.002	996
76.000	GPS	32	21.507	2.735	0.001	1297
75.000	Stand-off	32	20.912	2.691	0.001	1296

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	160 - 123.33 (1)	TP31.46x21.2x0.219	36.670	0.000	0.0	21.109	-12.864	1280.340	0.010
L2	123.33 - 86.17 (2)	TP41.44x29.715x0.344	41.830	0.000	0.0	43.711	-25.275	2903.880	0.009
L3	86.17 - 37.17 (3)	TP54.46x39.118x0.438	54.830	0.000	0.0	73.298	-43.514	4793.440	0.009
L4	37.17 - 0 (4)	TP64x51.533x0.469	44.500	0.000	0.0	95.943	-65.891	5850.220	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	160 - 123.33 (1)	TP31.46x21.2x0.219	579.173	781.276	0.741	0.000	781.276	0.000
L2	123.33 - 86.17 (2)	TP41.44x29.715x0.344	1730.225	2332.717	0.742	0.000	2332.717	0.000
L3	86.17 - 37.17 (3)	TP54.46x39.118x0.438	3639.333	5072.692	0.717	0.000	5072.692	0.000
L4	37.17 - 0 (4)	TP64x51.533x0.469	5799.083	7575.983	0.765	0.000	7575.983	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 123.33 (1)	TP31.46x21.2x0.219	24.978	640.169	0.039	0.562	1584.183	0.000
L2	123.33 - 86.17 (2)	TP41.44x29.715x0.344	35.742	1451.940	0.025	0.402	4730.025	0.000
L3	86.17 - 37.17 (3)	TP54.46x39.118x0.438	44.612	2396.720	0.019	0.594	10285.833	0.000
L4	37.17 - 0 (4)	TP64x51.533x0.469	52.128	2925.110	0.018	0.593	15361.749	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 123.33 (1)	0.010	0.741	0.000	0.039	0.000	0.753 ✔	1.000	4.8.2 ✔
L2	123.33 - 86.17 (2)	0.009	0.742	0.000	0.025	0.000	0.751 ✔	1.000	4.8.2 ✔
L3	86.17 - 37.17 (3)	0.009	0.717	0.000	0.019	0.000	0.727 ✔	1.000	4.8.2 ✔
L4	37.17 - 0 (4)	0.011	0.765	0.000	0.018	0.000	0.777 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 123.33	Pole	TP31.46x21.2x0.219	1	-12.864	1280.340	75.3	Pass
L2	123.33 - 86.17	Pole	TP41.44x29.715x0.344	2	-25.275	2903.880	75.1	Pass
L3	86.17 - 37.17	Pole	TP54.46x39.118x0.438	3	-43.514	4793.440	72.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L4	37.17 - 0	Pole	TP64x51.533x0.469	4	-65.891	5850.220	77.7	Pass
							Summary	
						Pole (L4)	77.7	Pass
						RATING =	**77.7**	**Pass**

Program Version 7.0.5.1 - 2/1/2016 File:J:/Jobs/1607100.WI/38_Orange CT CT2174/04_Structural/Backup Documentation/Calcs/ERI Files/160' Monopole_Orange_CT.eri

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Subject:	Anchor Bolt and Baseplate Analysis
Location:	160-FT Valmont Monopole Orange, CT
Rev. 0: 9/26/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16071.38

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$OM := 5799 \cdot ft \cdot kips$	(Input From RisaTower)
Shear Force =	$Shear := 52 \cdot kips$	(Input From RisaTower)
Axial Force =	$Axial := 66 \cdot kips$	(Input From RisaTower)

Anchor Bolt Data:

ASTM A615 Grade 75

Number of Anchor Bolts =	$N := 24$	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 72.76 \cdot in$	(User Input)
Bolt "Column" Distance =	$l := 3.0 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 100 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.25 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)
Top of Concrete to Bot Leveling Nut =	$l_{ar} := 2 \cdot in$	(User Input)

Base Plate Data:

Use ASTM A572 Grade 60

Plate Yield Strength =	$Fy_{bp} := 60 \cdot ksi$	(User Input)
Base Plate Thickness =	$t_{bp} := 3 \cdot in$	(User Input)
Base Plate Diameter =	$D_{bp} := 78.76 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 64 \cdot in$	(User Input)
	$\eta := 0.5$	For Ungrouted Base Plate per TIA-222-G Section 4.9.9

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 36.38 \cdot in$

Distance to Bolts = $i := 1 .. N$

$$d_i := \left\| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N} \right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 9.42 \cdot in$

$d_2 = 18.19 \cdot in$

$d_3 = 25.72 \cdot in$

$d_4 = 31.51 \cdot in$

$d_5 = 35.14 \cdot in$

$d_6 = 36.38 \cdot in$

$d_7 = 35.14 \cdot in$

$d_8 = 31.51 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 32 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$

$MA_2 = 0.00 \cdot in$

$MA_3 = 0.00 \cdot in$

$MA_4 = 0.00 \cdot in$

$MA_5 = 3.14 \cdot in$

$MA_6 = 4.38 \cdot in$

$MA_7 = 3.14 \cdot in$

$MA_8 = 0.00 \cdot in$

Effective Width of Baseplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 36.7 \cdot in$

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 1.588 \times 10^4 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 3.248 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 2.033 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.508 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.826 \cdot in^3$

Tensile Root Diameter = $d_{rt} := D - \frac{0.9743 \cdot in}{n} = 2.033 \cdot in$

Plastic Section Modulus = $Z := \frac{d_{rt}^3}{6} = 1.401 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N} = 156.7 \cdot kips$

Maximum Compressive Force = $P_u := OM \cdot \frac{R_{bc}}{I_p} + \frac{Axial}{N} = 162.2 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 2.2 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 259.815 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \cdot 100 = 64.1$

Condition1 = $Condition1 := if\left[\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed"\right]$

Condition1 = "OK"

Design Shear Strength = $\Phi R_{nv} := 0.75 \cdot 0.45 \cdot F_u \cdot A_g = 134.193 \cdot k$

Design Flexural Strength = $\Phi R_{nm} := 0.9 \cdot F_y \cdot Z = 94.597 \cdot in \cdot k$

$$M_u := \begin{cases} 0 & \text{if } l_{ar} < D \\ 0.65 \cdot l_{ar} \cdot V_u & \text{otherwise} \end{cases} = 0 \cdot in \cdot k$$

Bolt % of Capacity = $\left[\left(\frac{V_u}{\Phi R_{nv}}\right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}}\right)^2\right] \cdot 100 = 39$

Condition2 = $Condition2 := if\left[\left(\frac{V_u}{\Phi R_{nv}}\right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}}\right)^2 \le 1.00, \text{"OK"}, \text{"Overstressed"}\right]$

Condition2 = "OK"

Base Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 44.0 \cdot kips$

$C_2 = 82.5 \cdot kips$

$C_3 = 115.5 \cdot kips$

$C_4 = 140.8 \cdot kips$

$C_5 = 156.7 \cdot kips$

$C_6 = 162.2 \cdot kips$

$C_7 = 156.7 \cdot kips$

$C_8 = 140.8 \cdot kips$

Maximum Bending Stress in Plate = $f_{bp} := \sum_i \frac{4 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^2\right)} = 20.5 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 54 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 38.0 \cdot \%$

Condition2 = $Condition2 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

Condition2 = "Ok"

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Branford, CT 06405 F: (203) 488-8587

Subject:	FOUNDATION ANALYSIS
Location:	165-ft Valmont Monopole Orange, CT
Rev. 0: 9/26/16	Prepared by: T.J.L Checked by: C.F.C. Job no. 16071.38

Standard Monopole Foundation:

Input Data:

Tower Data

Overturning Moment =	$OM := 5799 \cdot ft \cdot kips$	(User Input)	
Shear Force =	$Shear := 52 \cdot kip$	(User Input)	
Axial Force =	$Axial := 66 \cdot kip$	(User Input)	
Tower Height =	$H_t := 160 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 14 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 10 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 8 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 4 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 22 \cdot ft$	(User Input)	

Anchor Bolt Data:

Length of Anchor Bolts =	$L_{st} := 132 \cdot in$	(User Input)	
Projection of Anchor Bolts Above Pier =	$A_{BP} := 10 \cdot in$	(User Input)	
Anchor Bolt Diameter =	$d_{anchor} := 2.25 \cdot in$	(User Input)	
Base Plate Bolt Circle =	$MP := 72.76 \cdot in$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Anchor Bolt Yield Strength =	$f_{ya} := 75000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_u := 20000 \cdot psf$	(User Input)	
Allowable Soil Bearing Capacity =	$q_a := \frac{q_u}{2} = 10000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 125 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 11$	(User Input)	
Bar Diameter =	$d_{bpier} := 1.41 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 31$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 3 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 9$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.128 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 35$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 10$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.27 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 35$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 1.561 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.999 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 1.267 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 125 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 3.75 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 3.75 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 5.25 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 4.5 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 4$

$A_p := W_f \cdot T_p = 88$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 396 \cdot kip$

Weight of Concrete Pad = $WT_c := \left[\left(W_f^2 \cdot T_f\right) + d_p^2 L_p\right] \cdot \gamma_c = 386.4 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left[\left(W_f^2 - d_p^2\right) \cdot \left(\left|L_p - L_{pag} - n\right|\right)\right] \cdot \gamma_s = 498.75 \cdot kip$

Weight of Soil Wedge at Back Face = $WT_{s2} := \left(\frac{D_f^2 \cdot \tan(\Phi_s)}{2} \cdot W_f\right) \cdot \gamma_s = 155.596 \cdot kip$

Weight of Soil Wedge at back face Corners = $WT_{s3} := 2 \cdot \left[(D_f)^3 \cdot \frac{\tan(\Phi_s)}{3}\right] \cdot \gamma_s = 132.021 \cdot kips$

Total Weight = $WT_{tot} := WT_c + WT_{s1} + Axial = 951.15 \cdot kip$

Resisting Weight = $WT_R := 0.9 \cdot WT_c + 0.75 \cdot WT_{s1} + 0.75 \cdot Axial = 771.322 \cdot kip$

Resisting Moment = $M_r := (WT_R) \cdot \frac{W_f}{2} + 0.75 \cdot S_u \cdot \frac{T_f}{3} + 0.75 \cdot \left[\left(WT_{s2} + WT_{s3}\right) \cdot \left(W_f + \frac{D_f \cdot \tan(\Phi_s)}{3}\right)\right] = 14207 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + Shear \cdot (L_p + T_f) = 6527 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.18$

Factor of Safety Required = $FS_{req} := 1$

$OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

$OverTurning\_Moment\_Check = "Okay"$

Shear Capacity in Pier:

Shear Resistance of Pier = $S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 824.017 \cdot kips$

$Shear\_Check := if(S_p > Shear, "Okay", "No Good")$

Shear_Check = "Okay"

Bearing Pressure Caused by Footing:

Area of the Mat = $A_{mat} := W_f^2 = 484$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 1774.67 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 5.643 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < .75 \cdot q_u, "Okay", "No Good")$

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{WT_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -1.713 \cdot ksf$

$Min\_Pressure\_Check := if\left[(P_{min} \geq 0) \cdot (P_{min} < .75 \cdot q_u), "Okay", "No Good"\right]$

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 5.626$

Distance to Kern = $X_k := \frac{W_f}{6} = 3.667$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{WT_{tot}} = 6.862$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot WT_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 6.966 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 6.966 \cdot ksf$

$Pressure\_Check := if(q_{adj} < .75 \cdot q_u, "Okay", "No Good")$

Pressure_Check = "Okay"

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 1.6 \times 10^4 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > Axial, "Okay", "No Good")$

Bearing_Check = "Okay"

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 3.644$

$d_1 := \frac{W_f}{2} - \frac{d_p}{2}$

$d_2 := d_1 - d$

$L := \left(\frac{W_f}{2} - e\right) \cdot 3$

$Slope := if\left(L > W_f, \frac{P_{max} - P_{min}}{W_f}, \frac{q_{adj}}{L}\right)$

$V_{req} := \left[\left(q_{adj} - Slope \cdot d_1\right) + \left(\frac{Slope \cdot d_1}{2}\right)\right] \cdot W_f \cdot d_1$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Beam_Shear_Check = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := \left(d_p + d\right) \cdot \pi = 36.6$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot \left(d_p + d\right)^2}{4} = 106.5$

Area Outside of Perimeter = $A_{out} := A_{mat} - A_{bo} = 377.5$

Guess Value = $v_u := 1ksf$

(From "Foundation Analysis and design", By Joseph Bowles, Eq. 8-9)

Given $d^2 + d_p \cdot d = \frac{WT_{tot}}{\pi \cdot v_u}$

$v_u := Find(v_u) = 7.1 \cdot ksf$

$V_u := v_u \cdot d \cdot W_f = 572 \cdot kips$

Required Shear Strength = $V_{req} := V_u = 572 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 4127.9 \cdot kip$ (ACI-2008 11.11.2.1)

$Punching\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

$Punching\_Shear\_Check = "Okay"$

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

$q_b := q_{adj} - d_1 \cdot Slope = 3.038 \cdot ksf$

Maximum Bending at Face of Pier = $M_n := \frac{1}{\phi_m} \cdot \left[(q_{adj} - q_b) \cdot \frac{d_1^2}{3} + q_b \cdot \frac{d_1^2}{2} \right] \cdot W_f = 3387.6 \cdot kip \cdot ft$

$$\beta := \begin{cases} 0.85 & \text{if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 & \text{if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000 \right)}{1000} \right] \cdot 0.5 \right] & \text{otherwise} \end{cases} = 0.85$$

(ACI-200810.2.7.3)

$R_n := \frac{M_n}{W_f \cdot d^2} = 80.5 \cdot psi$

$\rho := \frac{0.85 \cdot f_c}{f_y} \left(1 - \sqrt{1 - \frac{2 \cdot R_n}{0.85 \cdot f_c}} \right) = 0.0014$

$\rho_{min} := \rho = 0.00136$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases}$$ (ACI -2008 7.12.2.1)

Check Bottom Bars:

$$As := \begin{cases} \rho_{min} \cdot W_f \cdot d & \text{if } \rho_{min} > \frac{\rho_{sh}}{2} \\ \rho_{sh} \cdot W_f \cdot \frac{d}{2} & \text{otherwise} \end{cases} = 15.681 \cdot in^2$$

$As_{prov} := A_{bbot} \cdot NB_{bot} = 44.3 \cdot in^2$

$Pad\_Reinforcement\_Bot := if(As_{prov} > As, "Okay", "No Good")$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$As := \rho_{sh} \cdot \left(W_f \cdot \frac{d}{2}\right) = 10.4 \cdot in^2$

$As_{prov} := A_{btop} \cdot NB_{top} = 35 \cdot in^2$

$Pad\_Reinforcement\_Top := if(As_{prov} > As, "Okay", "No Good")$

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 6.28 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$$

Transverse Reinforcement Index =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 38.3 \cdot in$$

Minimum Development Length =

$L_{dbmin} := 12 \cdot in$ (ACI-2008 12.2.1)

$L_{dbtCheck} := if(L_{dbt} \geq L_{dbmin}, "Use L.dbt", "Use L.dbmin")$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{d_p}{2} - Cvr_{pad} = 81 \cdot in$$

$Lpad\_Check := if(L_{Pad} > L_{dbt}, "Okay", "No Good")$

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier = $A_p := d_p^2 = 9216 \cdot in^2$

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 46.08 \cdot in^2$ (ACI-2008 10.8.4 & 10.9.1)

$A_{sprov} := NB_{pier} \cdot A_{bpier} = 48.4 \cdot in^2$

$Steel\_Area\_Check := if(A_{sprov} > A_{smin}, "Okay", "No Good")$

Steel_Area_Check = "Okay"

NOTE: Anchor Bolts are not accounted for in reinforcement calculation and will provide additional reinforcement to satisfy minimum requirement of steel.

Bar Spacing In Pier = $B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 8.319 \cdot in$

Diameter of Reinforcement Cage = $Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 90 \cdot in$

Maximum Moment in Pier = $M_p := \left[OM + Shear \cdot \left(L_p + \frac{A_{BP}}{2} \right) \right] = 76088 \cdot in \cdot kips$

Pier Check evaluated from outside program and results are listed below;

$(D \; N \; n \; P_u \; M_{xu}) := \left(d_p \cdot 12 \;\; NB_{pier} \;\; BS_{pier} \;\; \frac{Axial \cdot 1.333}{kips} \;\; \frac{M_p}{in \cdot kips} \right)$

$(D \; N \; n \; P_u \; M_{xu}) = (96 \;\; 31 \;\; 11 \;\; 88 \;\; 76088)$

$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := (0 \;\; 0 \;\; 0 \;\; 0)$

$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := \phi P'_n(D, N, n, P_u, M_{xu})^T$

$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) = (123.7 \;\; 1.1 \times 10^5 \;\; -60 \;\; 0)$

$Axial\_Load\_Check := if(\phi P_n \geq P_u, "Okay", "No Good")$

Axial_Load_Check = "Okay"

$Bending\_Check := if(\phi M_{xn} \geq M_{xu}, "Okay", "No Good")$

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 117 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 45 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

$c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 3 \cdot in$

Transverse Reinforcement = $k_{tr} := 0$ (ACI-2008 12.2.3)

$L_{dbt} := \frac{3 \cdot f_y \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 47.15 \cdot in$

Minimum Development Length = $L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 18.727 \cdot in$ (ACI 12.2.1)

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right)$

$L_{tension\_Check} := if\left(L_{pier} + L_{pad} > L_{dbt}, "Okay", "No Good"\right)$

$L_{tension\_Check} = "Okay"$

Compression: (ACI-2008 12.3.2)

$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 26.753 \cdot in$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 25.38 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 26.753 \cdot in$

$L_{compression\_Check} := if\left(L_{pier} + L_{pad} > L_{dbc}, "Okay", "No Good"\right)$

$L_{compression\_Check} = "Okay"$

Tie Size and Spacing in Column:

Minimum Tie Size = $Tie_{min} := if(BS_{pier} \le 10, 3, 4) = 4$

Used #3 Ties

Seismic Factor = $z := if(Z \le 2, 1, 0.5) = 1$ (ACI-2008 21.10.5)

$s_{lim1} := 16 \cdot d_{bpier} \cdot z = 22.56 \cdot in$

$s_{lim2} := \frac{48 \cdot d_{Tie}}{8} \cdot z = 18 \cdot in$

$s_{lim3} := D_f \cdot z = 168 \cdot in$

$s_{lim4} := 18in$

Maximum Spacing = $s_{tie} := \min\left(\begin{pmatrix} s_{lim1} \\ s_{lim2} \\ s_{lim3} \\ s_{lim4} \end{pmatrix}\right) = 18 \cdot in$

Number of Ties Required = $n_{tie} := \frac{L_{pier} - 3 \cdot in}{s_{tie}} + 1 = 7.333$

Check Anchor Steel Embedment:

Depth Available = $D_{ab} := L_{st} - A_{BP} = 10.167 \cdot ft$

Length of Anchor Bolt = $L_{anchor} := \frac{(0.11 \cdot f_{ya}) \cdot in}{\sqrt{f_c \cdot psi}} = 10.87 \cdot ft$

$Depth\_Check := if(D_{ab} \ge L_{anchor}, "Okay", "No Good")$

Depth_Check = "No Good"

Note: Anchor plate is provided

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTU2174	DATE:	03/09/2016	RF DESIGN ENG:	Md Mateen	RF PERF ENG:		RFDS PROGRAM TYPE:	2017 LTE Next Carrier
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:		RF PERF PHONE:		RFDS TECHNOLOGY:	LTE 2C
REVISION:	Final	RF MANAGER:	Cameron Syme	RF DESIGN EMAIL:	MM093Q@ATT.COM	RF PERF EMAIL:		State:	Final
INITIATIVE /PROJECT:	LTE 2C 1900 A3-A4 w/ Bronze Standard configuration.// DUL to DUS upgrade add XMU.					TRIDENT:		Status:	Approved
						GSM FREQUENCY:	850	RFDS ID:	1111475
						UMTS FREQUENCY:	850, 1900	RFDS Version:	2.00
						LTE FREQUENCY:	700, 1900	Created By:	mm093q
								Date Created:	3/9/2016 9:42:49 AM
								Date Updated:	8/9/2016 1:11:47 PM
								Updated By:	mm093q
						I-PLAN JOB # 1:	NER-RCTB-12-04639	IPLAN PRD GRP || SUB GRP #1:	LTE Next Carrier || LTE 2C
						I-PLAN JOB # 2:		IPLAN PRD GRP || SUB GRP #2:	
						I-PLAN JOB # 3:		IPLAN PRD GRP || SUB GRP #3:	
						I-PLAN JOB # 4:		IPLAN PRD GRP || SUB GRP #4:	

Section 2 - LOCATION INFORMATION

USID:	4557	FA LOCATION CODE:	10035120	LOCATION NAME:	GEORGES CELLAR HILL SOUTH	ORACLE PTN # 1:		PACE JOB # 1:	MRCTB018169
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PTN # 2:		PACE JOB # 2:	
ADDRESS:	525 ORANGE CENTER ROAD	CITY:	ORANGE	STATE:	CT	ORACLE PTN # 3:		PACE JOB # 3:	
ZIP CODE:	06477	COUNTY:	NEW HAVEN	MSA / RSA:		ORACLE PTN # 4:		PACE JOB # 4:	
LATITUDE (D-M-S):	41d 16m25.26996s	LONGITUDE (D-M-S):	-73d -1m-7.79484s	LAT (DEC. DEG.):	41.2736861	SEARCH RING NAME:			
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	2174 ORANGE CENTRAL I 95 NORTH TO EXIT 41 MARSH HILL ROAD TURN LEFT ONTO MARSHILL ROAD GO 8 MILES TO RT 1 TURN LEFT GO 4 MILES TO RT 152 ORANGE CENTER ROAD TURN RIGHT GO 1 1 MILE TO COMMUNITY CENTER ON RIGHT SITE IN REAR SECURITY: SESAMEE ON GATE 0043POWER COMPANY: UNITED ILLUMINATING (800) 722-5584METER# IFF-09614187DEMARK IS LOCATED INSIDE SHELTER (GSM) ET113-HCGS238892 ET223-HCGS238893					SEARCH RING ID:		CASPR INITIATIVE # 1:	
						BTA:		CASPR INITIATIVE # 2:	
						LONG (DEC. DEG.):	-73.0188319	CASPR INITIATIVE # 3:	
						BORDER CELL WITH CONTOUR COORD:		CASPR INITIATIVE # 4:	
						AM STUDY REQ'D (Y/N):	No		
						FREQ COORD:			

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:		CGSA CALL SIGNS:	z_KNLB312,z_KNLB312,z_KNLB312
CGSA - MINOR FILING NEEDED (Yes/No)::	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:			
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:					

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):		STRUCTURE TYPE:	SELF SUPPORT	MARKET LOCATION 700 MHz Band:		
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	162.00	FCC ASR NUMBER:	NR	MARKET LOCATION 850 MHz Band:		
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	162.00			MARKET LOCATION 1900 MHz Band:		
LIGHTING TYPE:	NOT REQUIRED					MARKET LOCATION AWS Band:		
						MARKET LOCATION WCS Band:		
						MARKET LOCATION Future Band:		

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911	ORANGE POLICE DEPARTMENT	1377		INTRADO_MIAMI		0		
SECTOR B	CONNECTICUT STATE POLICE-I TROOP	1321		INTRADO_MIAMI		0		
SECTOR C	ORANGE POLICE DEPARTMENT	1377		INTRADO_MIAMI		0		
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911	ORANGE POLICE DEPARTMENT	1377		INTRADO_MIAMI		0		
SECTOR B	CONNECTICUT STATE POLICE-I TROOP	1321		INTRADO_MIAMI		0		
SECTOR C	ORANGE POLICE DEPARTMENT	1377		INTRADO_MIAMI		0		
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 6 - RBS GENERAL INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS						
RBS ID:	128707	176754	172430	247017	401477	360154						
CTS COMMON ID:	318D2174_2	318P2174	CTU2174	CTV2174	CTU6174	CTL02174						
CELL ID / BCF:	049D2174	318P2174	CTU2174	CTU2174	CTU6174	CTL02174						
BTA/TID:	049G	318P	318V	318U	318W	318L						
4-DIGIT SITE ID:	2174	9174	2174	2174	6174	2174						
COW OR TOY?:	No	No	No	No	No	No						
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED						
SITE TYPE:	BTS-CONVENTIONAL	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL						
BTS LOCATION ID:	GROUND		INTERNAL	INTERNAL	INTERNAL	INTERNAL						
ORIGINATING CO:	CINGULAR	CINGULAR	CINGULAR	CINGULAR	CINGULAR	CINGULAR						
CELLULAR NETWORK:	GOLD	GOLD	GOLD	GOLD	GOLD	GOLD						
OPS DISTRICT:	SOUTH		CT SOUTH-EAST	CT SOUTH-EAST	CT-SOUTH	CT SOUTH-EAST						
RF DISTRICT:	SOUTH	NPO TRIAGE	NPO TRIAGE	BRIDGEPORT	NPO TRIAGE	NPO TRIAGE						
OPS ZONE:	NE_CT_S_NHVN_SW_CS		NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS						
RF ZONE:	BCT05 - NEW HAVEN	HOTSEAT	HOTSEAT	BBP03	HOTSEAT	HOTSEAT						
BASE STATION TYPE:	BASE	BASE	BASE	OVERLAY	OVERLAY	BASE						
EQUIPMENT NAME:	GEORGES CELLAR HILL SOUTH	GEORGES CELLAR HILL SOUTH	GEORGES CELLAR HILL SOUTH	ORANGE - CENTRAL	GEORGES CELLAR - HILL SOUTH	GEORGES CELLAR HILL SOUTH						
DISASTER PRIORITY:	0	0	2	0	0	3						

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS						
RBS ID:	128707	176754	172430	247017	401477	360154						
CTS COMMON ID:	318D2174_2	318P2174	CTU2174	CTV2174	CTU6174	CTL02174						
CELL ID / BCF:	049D2174		CTU2174	CTU2174	CTU6174	CTL02174						
BTA/TID:	049G	318P	318V	318U	318W	318L						
4-DIGIT SITE ID:	2174	9174	2174	2174	6174	2174						
COW OR TOY?:	No	No	No	No	No	No						
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED						
SITE TYPE:	BTS-CONVENTIONAL	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL						
BTS LOCATION ID:	GROUND		INTERNAL	INTERNAL	INTERNAL	INTERNAL						
ORIGINATING CO:	CINGULAR	CINGULAR	CINGULAR	CINGULAR	CINGULAR	CINGULAR						
CELLULAR NETWORK:	GOLD	GOLD	GOLD	GOLD	GOLD	GOLD						
OPS DISTRICT:	CT-South	CT-South	CT-South	CT-South	CT-South	CT-South						
RF DISTRICT:	NPO Triage	NPO Triage	NPO Triage	NPO Triage	NPO Triage	NPO Triage						
OPS ZONE:	NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS	NE_CT_S_NHVN_SW_CS						
RF ZONE:	Hotseat	Hotseat	Hotseat	Hotseat	Hotseat	Hotseat						
BASE STATION TYPE:	BASE	BASE	BASE	OVERLAY	OVERLAY	BASE						
EQUIPMENT NAME:	GEORGES CELLAR HILL SOUTH	GEORGES CELLAR HILL SOUTH	GEORGES CELLAR HILL SOUTH	ORANGE - CENTRAL	GEORGES CELLAR - HILL SOUTH	GEORGES CELLAR HILL SOUTH						
DISASTER PRIORITY:	0	0	2	0	0	3						

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS						
MSC:												
BSC/RNC/MME POOL ID:	BRIDGEPORT BSC 03	BRIDGEPORT BSC 03	BRIDGEPORT CT RNC5	BRIDGEPORT CT RNC5	BRIDGEPORT CT RNC5	FF01						
LAC:	05012	05012	05991	05991	05991							
RAC:												
EQUIPMENT VENDOR:	NOKIA	NOKIA	ERICSSON	ERICSSON	ERICSSON	ERICSSON						
EQUIPMENT TYPE:	ULTRASITE	ULTRASITE	3206 INDOOR	3206 INDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU						
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:						CT						
AGPS:	Yes	Yes	Yes	Yes	Yes	Yes						
NODE B NUMBER:	0	0	0	0	0	2174						
PARENT NAME:	BRIDGEPORT BSC 03	BRIDGEPORT BSC 03	BRIDGEPORT CT RNC5	BRIDGEPORT CT RNC5	BRIDGEPORT CT RNC5	FF01						

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS						
MSC:												
BSC/RNC/MME POOL ID:	BRPTCTBSC03	BRPTCTBSC03	BRPTCT04CR0R05	BRPTCT04CR0R05	BRPTCT04CR0R05	FF01						
LAC:	05012	05012	05991	05991	05991							
RAC:												
EQUIPMENT VENDOR:	NOKIA	NOKIA	ERICSSON	ERICSSON	ERICSSON	ERICSSON						
EQUIPMENT TYPE:	ULTRASITE	ULTRASITE	3206 INDOOR	3206 INDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU						
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:						CT						
AGPS:	Yes	Yes	Yes	Yes	Yes	Yes						
NODE B NUMBER:	0	0	0	0	0	2174						
PARENT NAME:	BRIDGEPORT BSC 03	BRIDGEPORT BSC 03	BRIDGEPORT RNC05	BRIDGEPORT RNC05	BRIDGEPORT RNC05							

Section 8 - RBS/SECTOR ASSOCIATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS												
CTS Common ID	318D2174_2	318P2174	CTU2174	CTV2174	CTU6174	CTL02174												
Soft Sector IDs	318G21741	318P21744	CTU21747	CTV21741	CTV6174A	CTL02174_7A_1												
	318G21742	318P21745	CTU21748	CTV21742	CTV6174B	CTL02174_7B_1												
	318G21743	318P21746	CTU21749	CTV21743	CTV6174C	CTL02174_7C_1												

Section 8 - RBS/SECTOR ASSOCIATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS												
CTS Common ID	318D2174_2	318P2174	CTU2174	CTV2174	CTU6174	CTL02174												
Soft Sector IDs	318G21741		CTU21747	CTV21741	CTV6174A	CTL02174_7A_1												
	318G21742		CTU21748	CTV21742	CTV6174B	CTL02174_7B_1												
	318G21743		CTU21749	CTV21743	CTV6174C	CTL02174_7C_1												
						CTL02174_9A_1												
						CTL02174_9B_1												
						CTL02174_9C_1												

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900																		
USEID (excluding Hard Sector)	4557.850.25G.1	4557.1900.25G.3	4557.850.3G.1	4557.1900.3G.1	4557.850.3G.2																				
SECTOR A SOFT SECTOR ID	318G21741	318P21744	CTV21741	CTU21747	CTV6174A	CTL02174_7A_1																			
SECTOR B	318G21742	318P21745	CTV21742	CTU21748	CTV6174B	CTL02174_7B_1																			
SECTOR C	318G21743	318P21746	CTV21743	CTU21749	CTV6174C	CTL02174_7C_1																			
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900																		
USEID (excluding Hard Sector)	4557.850.25G.1		4557.850.3G.1	4557.1900.3G.1	4557.850.3G.2																				
SECTOR A SOFT SECTOR ID	318G21741		CTV21741	CTU21747	CTV6174A	CTL02174_7A_1	CTL02174_9A_1																		
SECTOR B	318G21742		CTV21742	CTU21748	CTV6174B	CTL02174_7B_1	CTL02174_9B_1																		
SECTOR C	318G21743		CTV21743	CTU21749	CTV6174C	CTL02174_7C_1	CTL02174_9C_1																		
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900																		
USEID (excluding Hard Sector)	4557.850.25G.1	4557.1900.25G.3	4557.850.3G.1	4557.1900.3G.1	4557.850.3G.2																				
SECTOR A CELL NUMBER						15																			
SECTOR B						16																			
SECTOR C						17																			
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900																		
USEID (excluding Hard Sector)	4557.850.25G.1		4557.850.3G.1	4557.1900.3G.1	4557.850.3G.2																				
SECTOR A CELL NUMBER						15	8																		
SECTOR B						16	9																		
SECTOR C						17	10																		
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 10 - CID/SAC - existing

		GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900																				
SECTOR A	CID/SAC	21741	21744	21741	21747	61741																						
SECTOR B		21742	21745	21742	21748	61742																						
SECTOR C		21743	21746	21743	21749	61743																						
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 10 - CID/SAC - final

		GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900																				
SECTOR A	CID/SAC	21741		21741	21747	61741																						
SECTOR B		21742		21742	21748	61742																						
SECTOR C		21743		21743	21749	61743																						
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 15A - CURRENT SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770		7770	P65-16-XLH-RR			
ANTENNA VENDOR	Powerwave		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	55X11X5		55X11X5	72X12X6			
ANTENNA WEIGHT	35		35	64			
AZIMUTH	138		138	30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145	145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	2		2	0			
FEEDER AMOUNT	2		2				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 KATHREIN 860-10025		2 KATHREIN 860-10025	Internal			
SURGE ARRESTOR (QTY/MODEL)				1 DC/Fiber Squid			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 Powerwave / LGP 21901				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			1 KATHREIN 860-10006	LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)		2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 POLYPHASER 1000860		2 POLYPHASER 1000860				
PDU FOR TMAS (QTY/MODEL)	1 LGP 12104 (1900 AND 850 Bypass TMA)						
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		4557.A.850.3G.1	CTV21741	CTV21741		UMTS 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806									
	PORT 2		4557.A.850.3G.1	CTV21741	CTV6174A		UMTS 850	7770.00.850.02	13.5		2	BOTTOM	RFS 1-1/4 (850)	175.044806									
	PORT 3		4557.A.1900.3G.1	CTU21747	CTU21747		UMTS 1900	7770.00.1900.00	15.5		0	None	RFS 1-1/4 (1900)	175.044806									
ANTENNA POSITION 3	PORT 1		4557.A.850.25G.1	318G21741			GSM 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806					12.58	141.57			
ANTENNA POSITION 4	PORT 1		4557.A.700.4G.1	CTL02174_7A_1	CTL02174_7A_1		LTE 700	P65-16-XLH-RR_716MHz_02DT	14.8		2	TOP	FIBER	0									

Section 15B - CURRENT SECTOR/CELL INFORMATION - SECTOR B

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770		7770	P65-16-XLH-RR			
ANTENNA VENDOR	Powerwave		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	55X11X5		55X11X5	72X12X6			
ANTENNA WEIGHT	35		35	64			
AZIMUTH	261		261	150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145	145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	2		2				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 KATHREIN 860-10025		2 KATHREIN 860-10025	Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 Powerwave / LGP 21901				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)		2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 POLYPHASER 1000860		2 POLYPHASER 1000860				
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		4557.B.850.3G.1	CTV21742	CTV21742		UMTS 850	7770.00.850.04	13.5		4	None	RFS 1-1/4 (850)	175.044806									
	PORT 2		4557.B.850.3G.1	CTV21742	CTV6174B		UMTS 850	7770.00.850.04	13.5		4	BOTTOM	RFS 1-1/4 (850)	175.044806									
	PORT 3		4557.B.1900.3G.1	CTU21748	CTU21748		UMTS 1900	7770.00.1900.00	15.5		0	None	RFS 1-1/4 (1900)	175.044806									
ANTENNA POSITION 3	PORT 1		4557.B.850.25G.1	318G21742			GSM 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806					11.22	126.18			
ANTENNA POSITION 4	PORT 1		4557.B.700.4G.1	CTL02174_7B_1	CTL02174_7B_1		LTE 700	P65-16-XLH-RR_716MHz_02DT	14.8		2	TOP	FIBER	0									

Section 15C - CURRENT SECTOR/CELL INFORMATION - SECTOR C

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770		7770	P65-16-XLH-RR			
ANTENNA VENDOR	Powerwave		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	55X11X5		55X11X5	72X12X6			
ANTENNA WEIGHT	35		35	64			
AZIMUTH	25		25	270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145	145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	2		2				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 KATHREIN 860-10025		2 KATHREIN 860-10025	Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 Powerwave / LGP 21901				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)		2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 POLYPHASER 1000860		2 POLYPHASER 1000860				
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		4557.C.850.3G.1	CTV21743	CTV21743		UMTS 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806									
	PORT 2		4557.C.850.3G.1	CTV21743	CTV6174C		UMTS 850	7770.00.850.02	13.5		2	BOTTOM	RFS 1-1/4 (850)	175.044806									
	PORT 3		4557.C.1900.3G.1	CTU21749	CTU21749		UMTS 1900	7770.00.1900.00	15.5		0	None	RFS 1-1/4 (1900)	175.044806									
ANTENNA POSITION 3	PORT 1		4557.C.850.25G.1	318G21743			GSM 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806					11.22	126.18			
ANTENNA POSITION 4	PORT 1		4557.C.700.4G.1	CTL02174_7C_1	CTL02174_7C_1		LTE 700	P65-16-XLH-RR_716MHz_06DT	14.8		6	TOP	FIBER	0									

Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				HPA-65R-BUU-H6			
ANTENNA VENDOR				CCI Products			
ANTENNA SIZE (H x W x D)				72X14.8X9			
ANTENNA WEIGHT				51			
AZIMUTH				30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1	RRUS-12+RRUS-A2		
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 1900 will be 2C at the site with Bronze Standard configuration, replace the exisiting LTE Antenna with Hex port antenna, Add LTE 1900 RRUS-12+RRUS-A2, reuse existing DC Fiber squid, DUL to DUS upgrade// Add XMU.						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		4557.A.1900.4G.1	CTL02174_9A_1	CTL02174_9A_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_02DT	17.21		2	TOP	FIBER	0									

Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR B

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				HPA-65R-BUU-H6			
ANTENNA VENDOR				CCI Products			
ANTENNA SIZE (H x W x D)				72X14.8X9			
ANTENNA WEIGHT				51			
AZIMUTH				150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1	RRUS-12+RRUS-A2		
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 1900 will be 2C at the site with Bronze Standard configuration, replace the exisiting LTE Antenna with Hex port antenna, Add LTE 1900 RRUS-12+RRUS-A2, reuse existing DC Fiber squid, DUL to DUS upgrade// Add XMU.						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		4557.B.1900.4G.1	CTL02174_9B_1	CTL02174_9B_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_02DT	17.21		2	TOP	FIBER	0									

Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR C

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				HPA-65R-BUU-H6			
ANTENNA VENDOR				CCI Products			
ANTENNA SIZE (H x W x D)				72X14.8X9			
ANTENNA WEIGHT				51			
AZIMUTH				270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1	RRUS-12+RRUS-A2		
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 1900 will be 2C at the site with Bronze Standard configuration, replace the exisiting LTE Antenna with Hex port antenna, Add LTE 1900 RRUS-12+RRUS-A2, reuse existing DC Fiber squid, DUL to DUS upgrade// Add XMU.						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		4557.C.1900.4G.1	CTL02174_9C_1	CTL02174_9C_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_06DT	17.21		6	TOP	FIBER	0									

Section 17A - FINAL SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770		7770	HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave		Powerwave	CCI Products			
ANTENNA SIZE (H x W x D)	55X11X5		55X11X5	72X14.8X9			
ANTENNA WEIGHT	35		35	51			
AZIMUTH	138		138	30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145	145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	2		2	0			
FEEDER AMOUNT	2		2				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 KATHREIN 860-10025		2 KATHREIN 860-10025	Internal			
SURGE ARRESTOR (QTY/MODEL)				1 DC/Fiber Squid			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 Powerwave / LGP 21901				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			1 KATHREIN 860-10006	LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)		2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 POLYPHASER 1000860		2 POLYPHASER 1000860				
PDU FOR TMAS (QTY/MODEL)	1 LGP 12104 (1900 AND 850 Bypass TMA)						
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 1900 will be 2C at the site with Bronze Standard configuration, replace the exisiting LTE Antenna with Hex port antenna, Add LTE 1900 RRUS-12+RRUS-A2, reuse existing DC Fiber squid, DUL to DUS upgrade// Add XMU.						
Local Market Note 2							
Local Market Note 3	Baseband Config- 1 DUS + XMU DUS-17A:7B:7C:X1P1:X1P2:_ XMU-1PA:PA2A:PB:PA2B:PC:PA2C:_:_:_:_:_:_:_:D1E:D1D						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4557.A.850.3G.1	4557.A.850.3G.1	CTV21741	CTV21741		UMTS 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806						269.77		1	
	PORT 2	4557.A.850.3G.1,4557.A.850.3G.2	4557.A.850.3G.1	CTV21741	CTV6174A		UMTS 850	7770.00.850.02	13.5		2	BOTTOM	RFS 1-1/4 (850)	175.044806						269.77		2	
	PORT 3	4557.A.1900.3G.1	4557.A.1900.3G.1	CTU21747	CTU21747		UMTS 1900	7770.00.1900.00	15.5		0	None	RFS 1-1/4 (850)	175.044806						289.73		1	
ANTENNA POSITION 3	PORT 1	4557.A.850.25G.1	4557.A.850.25G.1	318G21741			GSM 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806					12.58	141.57		5	
ANTENNA POSITION 4	PORT 1	4557.A.700.4G.1	4557.A.700.4G.1	CTL02174_7A_1	CTL02174_7A_1		LTE 700	HPA-65R-BUU-H6_716MHz_02DT	14.8		2	TOP	FIBER	0						827.9421		7	
	PORT 3	4557.A.1900.4G.tmp1	4557.A.1900.4G.1	CTL02174_9A_1	CTL02174_9A_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_02DT	17.21		2	TOP	FIBER	0						2152.7817		7	

Section 17B - FINAL SECTOR/CELL INFORMATION - SECTOR B

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770		7770	HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave		Powerwave	CCI Products			
ANTENNA SIZE (H x W x D)	55X11X5		55X11X5	72X14.8X9			
ANTENNA WEIGHT	35		35	51			
AZIMUTH	261		261	150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145	145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	2		2				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 KATHREIN 860-10025		2 KATHREIN 860-10025	Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 Powerwave / LGP 21901				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)		2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 POLYPHASER 1000860		2 POLYPHASER 1000860				
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 1900 will be 2C at the site with Bronze Standard configuration, replace the exisiting LTE Antenna with Hex port antenna, Add LTE 1900 RRUS-12+RRUS-A2, reuse existing DC Fiber squid, DUL to DUS upgrade// Add XMU.						
Local Market Note 2							
Local Market Note 3	Baseband Config- 1 DUS + XMU DUS-17A:7B:7C:X1P1:X1P2:_ XMU-1PA:PA2A:PB:PA2B:PC:PA2C:_:_:_:_:_:_:_:D1E:D1D						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4557.B.850.3G.1	4557.B.850.3G.1	CTV21742	CTV21742		UMTS 850	7770.00.850.04	13.5		4	None	RFS 1-1/4 (850)	175.044806						269.77		9	
	PORT 2	4557.B.850.3G.1,4557.B.850.3G.2	4557.B.850.3G.1	CTV21742	CTV6174B		UMTS 850	7770.00.850.04	13.5		4	BOTTOM	RFS 1-1/4 (850)	175.044806						269.77		10	
	PORT 3	4557.B.1900.3G.1	4557.B.1900.3G.1	CTU21748	CTU21748		UMTS 1900	7770.00.1900.00	15.5		0	None	RFS 1-1/4 (850)	175.044806						289.73		9	
ANTENNA POSITION 3	PORT 1	4557.B.850.25G.1	4557.B.850.25G.1	318G21742			GSM 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806					11.22	126.18		13	
ANTENNA POSITION 4	PORT 1	4557.B.700.4G.1	4557.B.700.4G.1	CTL02174_7B_1	CTL02174_7B_1		LTE 700	HPA-65R-BUU-H6_716MHz_02DT	14.8		2	TOP	FIBER	0						827.9421		15	
	PORT 3	4557.B.1900.4G.tmp1	4557.B.1900.4G.1	CTL02174_9B_1	CTL02174_9B_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_02DT	17.21		2	TOP	FIBER	0						2152.7817		15	

Section 17C - FINAL SECTOR/CELL INFORMATION - SECTOR C

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770		7770	HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave		Powerwave	CCI Products			
ANTENNA SIZE (H x W x D)	55X11X5		55X11X5	72X14.8X9			
ANTENNA WEIGHT	35		35	51			
AZIMUTH	25		25	270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145		145	145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	2		2				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 KATHREIN 860-10025		2 KATHREIN 860-10025	Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901		2 Powerwave / LGP 21901				
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)		2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)				
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 POLYPHASER 1000860		2 POLYPHASER 1000860				
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 1900 will be 2C at the site with Bronze Standard configuration, replace the exisiting LTE Antenna with Hex port antenna, Add LTE 1900 RRUS-12+RRUS-A2, reuse existing DC Fiber squid, DUL to DUS upgrade// Add XMU.						
Local Market Note 2							
Local Market Note 3	Baseband Config- 1 DUS + XMU DUS-17A:7B:7C:X1P1:X1P2:_ XMU-1PA:PA2A:PB:PA2B:PC:PA2C:_:_:_:_:_:_:_:D1E:D1D						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4557.C.850.3G.1	4557.C.850.3G.1	CTV21743	CTV21743		UMTS 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806						269.77		17	
	PORT 2	4557.C.850.3G.1,4557.C.850.3G.2	4557.C.850.3G.1	CTV21743	CTV6174C		UMTS 850	7770.00.850.02	13.5		2	BOTTOM	RFS 1-1/4 (850)	175.044806						269.77		18	
	PORT 3	4557.C.1900.3G.1	4557.C.1900.3G.1	CTU21749	CTU21749		UMTS 1900	7770.00.1900.00	15.5		0	None	RFS 1-1/4 (850)	175.044806						289.73		17	
ANTENNA POSITION 3	PORT 1	4557.C.850.25G.1	4557.C.850.25G.1	318G21743			GSM 850	7770.00.850.02	13.5		2	None	RFS 1-1/4 (850)	175.044806					11.22	126.18		21	
ANTENNA POSITION 4	PORT 1	4557.C.700.4G.1	4557.C.700.4G.1	CTL02174_7C_1	CTL02174_7C_1		LTE 700	HPA-65R-BUU-H6_716MHz_06DT	14.8		6	TOP	FIBER	0						827.9421		23	
	PORT 3	4557.C.1900.4G.tmp1	4557.C.1900.4G.1	CTL02174_9C_1	CTL02174_9C_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_06DT	17.21		6	TOP	FIBER	0						2152.7817		23	

Diagram - Sector	A	Diagram File Name - CT2174_A_B_C_BrnzStand_2C_Rev2.vsd					
Atoll Site Name -	CTU2174	Location Name -	GEORGES CELLAR HILL SOUTH	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

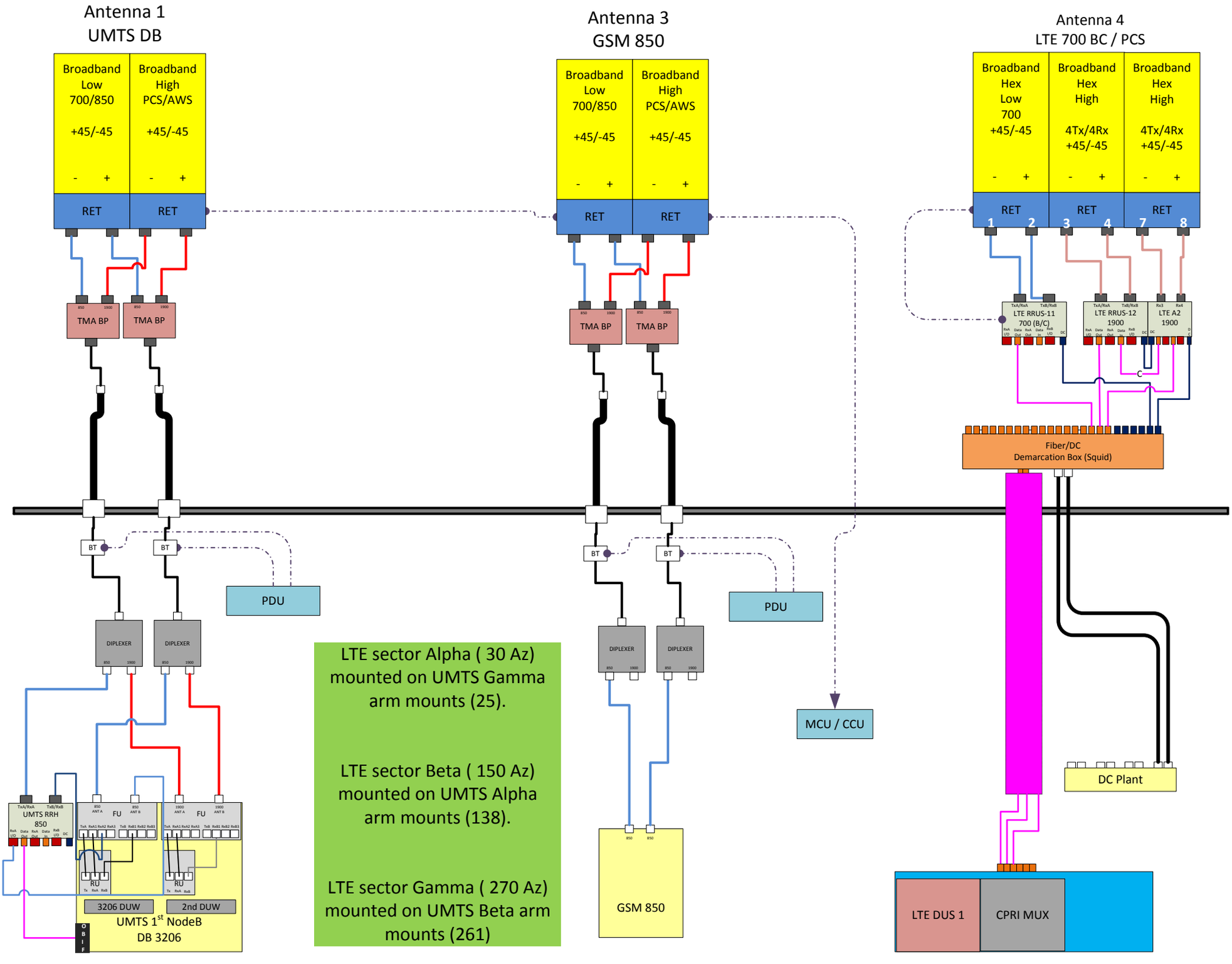


Diagram - Sector	B	Diagram File Name - CT2174_A_B_C_BrnzStand_2C_Rev2.vsd					
Atoll Site Name -	CTU2174	Location Name -	GEORGES CELLAR HILL SOUTH	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

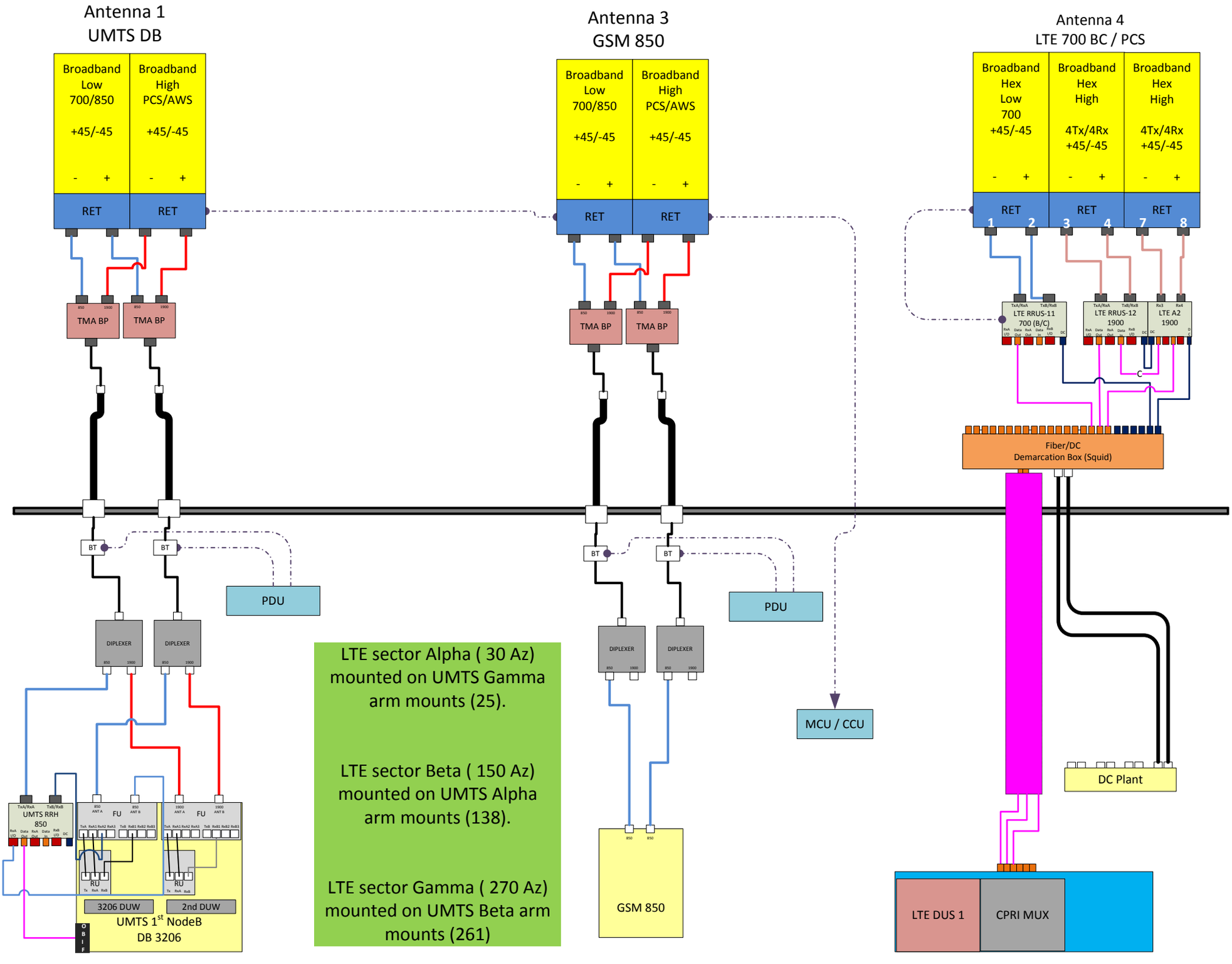
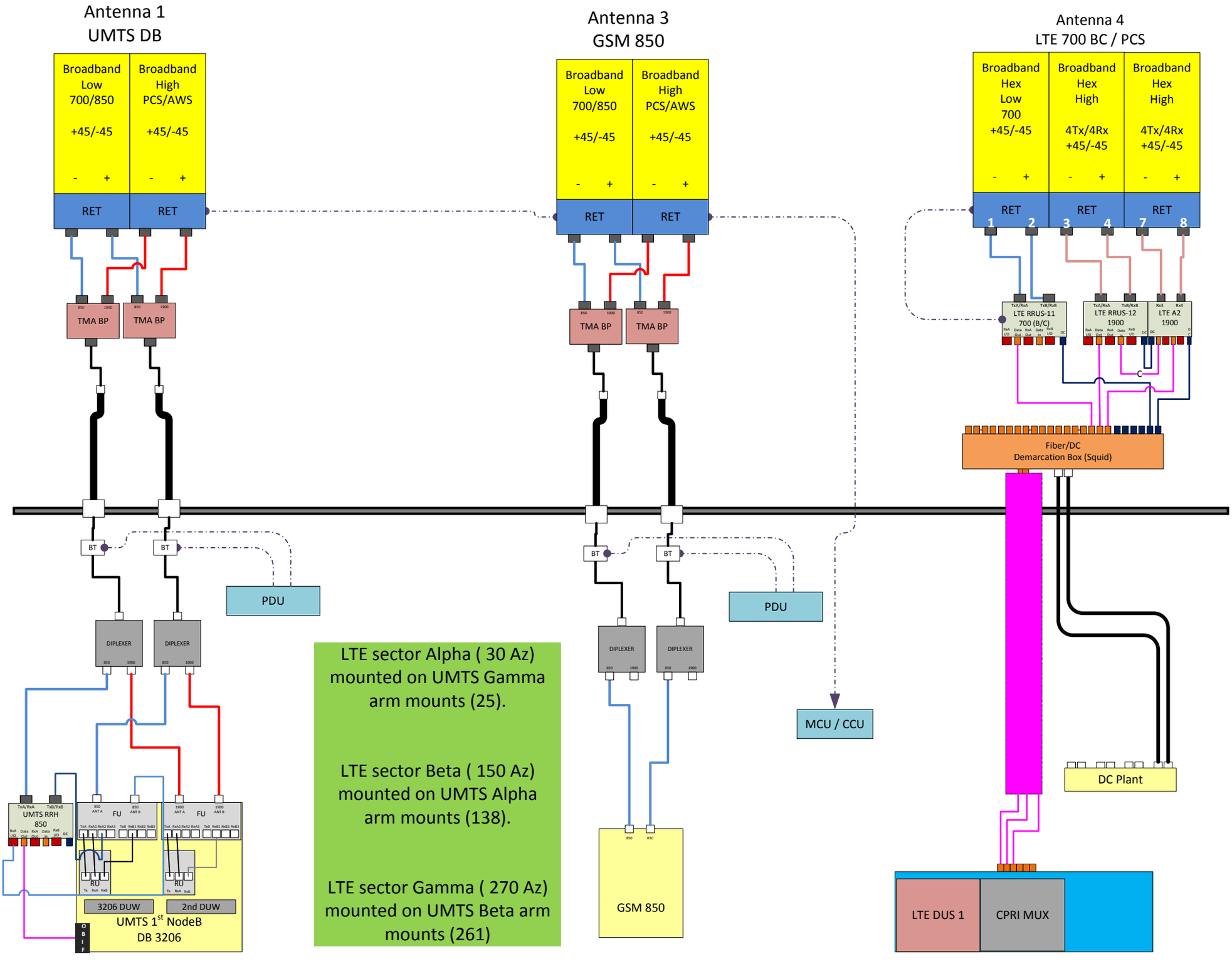


Diagram - Sector	C	Diagram File Name - CT2174_A_B_C_BrnzStand_2C_Rev2.vsd					
Atoll Site Name -	CTU2174	Location Name -	GEORGES CELLAR HILL SOUTH	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

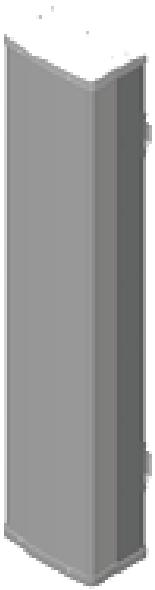


NOTES			
Date Time (Central)	Version	ATTUID	Note
3/22/2016 9:15:16 AM	1.00	dr701e	Updated RFDS with PACE number
8/9/2016 1:51:57 PM	2.00	mm093q	Updated to version 2, Revised to show LTE 1900 as RRUS-12+A2, add XMU in sec 16/17 and PD.

WORKFLOW SUMMARY						
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments
03/29/2016	Preliminary / In Progress	mm093q	Preliminary / Submitted for Approval	AB014M	Promote	LTE Preliminary RFDS
04/14/2016	Preliminary / Submitted for Approval	AB014M	Preliminary / Approved	BG144B	Promote	
08/08/2016	Preliminary / Approved	BG144B	Final / RF Approval	OM636A	Promote	Needs Final
08/08/2016	Final / RF Approval	OM636A	Final / RF Approval	MM093Q	Re-Assign	
08/09/2016	Final / RF Approval	MM093Q	Final / Approved	BG144B	Promote	Updated to version 2, Revised to show LTE 1900 as RRUS-12+A2, add XMU in sec 16/17 and PD.

HexPort Multi-Band Antenna

Model HPA-65R-BUU-H6



The CCI Hexport Multi-Band Antenna Array is an industry first 6-port antenna with full WCS Band Coverage. With four high band ports and two low band ports, our hexport antenna is ready for 4X4 high band MIMO.

Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.

Multiple networks can now be connected to a single antenna, reducing tower loading and leasing expense, while decreasing deployment time and installation cost.

Full band capability for 700 MHz , Cellular 850 MHz, PCS 1900 MHz, AWS 1710/2170 MHz and WCS 2300 MHz coverage in a single enclosure.

Hexport Multi-Band Antenna Array

Benefits

- **Includes WCS Band**
- **Reduces tower loading**
- **Frees up space for tower mounted E-nodes**
- **Single radome with six ports**
- **All Band design simplifies radio assignments**
- **Sharp elevation beam eases network planning**

Features

- High Band Ports include WCS Band
- Four High Band ports with two Low Band ports in one antenna
- Sharp elevation beam
- Excellent elevation side-lobe performance
- Excellent MIMO performance due to array spacing
- Excellent PIM Performance
- A multi-network solution in one radome

Applications

- 4x4 MIMO on High Band and 2x2 MIMO on Low Band
- Adding additional capacity without adding additional antennas
- Adding WCS Band without increasing antenna count

ISO 9001:2008
Quality Management Systems
Système de Qualité
www.ca.sgs.com

HexPort Multi-Band Antenna

Model HPA-65R-BUU-H6

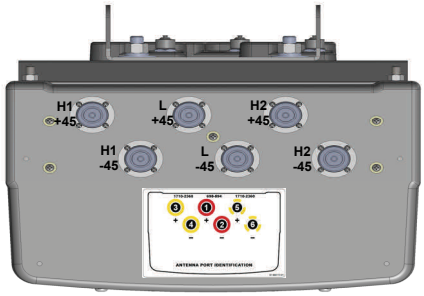
HPA-65R Multi-Band Antenna

Electrical Specifications

Frequency Range	2 X Low Band Ports which cover the full range from 698-894 MHz		4 X High Band Ports which cover the full range from 1710-2360 MHz			
	698-806 MHz	824-894 MHz	1850-1990 MHz	1710-1755/2110-2170 MHz		2305-2360 MHz
Gain	14.1 dBi	14.8 dBi	16.9 dBi	16.3 dBi	17.2 dBi	17.4 dBi
Azimuth Beamwidth (-3dB)	66°	65°	61°	66°	62°	57°
Elevation Beamwidth (-3dB)	12.5°	10.5°	5.7°	6.3°	5.1°	4.5°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -17 dB	< -19 dB	< -19 dB	< -18 dB	< -18 dB	< -17 dB
Front-to-Back Ratio @180°	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Front-to-Back Ratio over ± 20°	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Discrimination (at Peak)	> 25 dB	> 20 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross-Polar Discrimination (at ± 60°)	> 17 dB	> 14 dB	> 17 dB	> 17 dB	> 17 dB	> 17 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 26 dB	> 25 dB	> 26 dB	> 26 dB
VSWR	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc
Input Power	500 Watts CW	500 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical Specifications

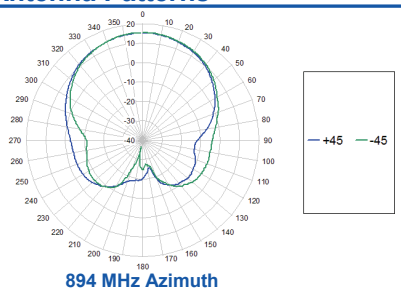
Dimensions (LxWxD)	72.0 x 14.8 x 9.0 inches (1828 x 376 x 229 mm)
Survival Wind Speed	> 150 mph
Front Wind Load	247 lbs (1099 N) @ 100 mph (161 kph)
Side Wind Load	165 lbs (735 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	9.7 ft^2 (0.90 m^2)
Weight (without Mounting)	51 lbs (23 kg)
RET System Weight	5.0 lbs (2.3 kg)
Connector	6; 7-16 DIN female long neck
Mounting Pole	2-5 inches (5-12 cm)



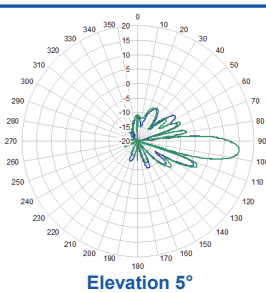
Bottom View

Rear View

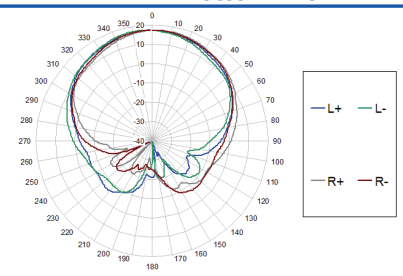
Antenna Patterns*



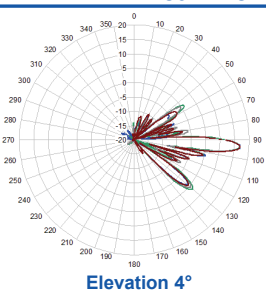
894 MHz Azimuth



Elevation 5°



1920 MHz Azimuth



Elevation 4°

*Typical antenna patterns. For detail information on antenna pattern, please contact us at info@cciproducts.com. All specifications are subject to change without notice.